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SEP 15
CHARLES ELMORE CROPLEY

No. 5 Original

IN THE

Supreme Court of the United States

OCTOBER TERM, 1942

THE STATE OF COLORADO, COMPLAINANT,

vs.

THE STATE OF KANSAS AND THE FINNEY COUNTY WATER USERS' ASSOCIATION, A CORPORATION, DEFENDANTS.

BRIEF FOR COMPLAINANT, THE STATE OF COLORADO.

GAIL L. IRELAND,
Attorney General
of the State of Colorado,

SAMUEL L. FAIRLAMB,
Assistant Attorney General,

ARTHUR C. GORDON,
Special Assistant
Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,
Special Counsel for Complainant.

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In The

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October Term, 1942

No. 5 Original

The State of Colorado, Complainant,

vs.

The State of Kansas and The Finney County Water Users' Association, a Corporation, Defendants.

BRIEF FOR COMPLAINANT, THE STATE OF COLORADO.

JURISDICTION

This is an action between States. Original jurisdiction is invoked under Article III, Sec. 2, Cl. 2, of the Constitution of the United States and Section 233 of the Judicial Code (28 U.S.C.A. Sec. 341). Leave to file the Bill of Complaint was granted January 3, 1928 (275 U. S. 511, 48 S. Ct. 204).

STATEMENT OF FACTS

This matter is before the Court on exceptions which have been filed by all the parties to the Report and Recommendations of the Special Master. The controversy involves the use for irrigation purposes of water of an interstate stream, the Arkansas river. In Colorado the appropriation system of water law applies. Kansas adheres to the riparian system except possibly as to certain lands in its western

counties where appropriation rights are allegedly recognized.

1. In General.

To protect its rights as fixed and determined by the judgment of this Court in *Kansas v. Colorado*, 206 U. S. 46, 27 S. Ct. 655, Colorado brought this suit against Kansas and a private corporation, The Finney County Water Users' Association. The complaint is in the nature of a bill of peace and the relief sought is: (a) An injunction against The Finney County Water Users' Association forbidding the further prosecution of two suits brought by that Association in the United States District Court for the District of Colorado against citizens of Colorado using water of the Arkansas river and its tributaries; and (b) Protection of the rights of Colorado and its citizens in the waters of the Arkansas river and its tributaries, as fixed and determined by this Court in the case of *Kansas v. Colorado, supra*, from further harassment by Kansas and its citizens.

The defendants filed a motion to dismiss which was denied "without prejudice to any question" (278 U. S. 574, 49 S. Ct. 92). Subsequently the defendants filed answers and cross-bills praying for an adjudication of their rights to Arkansas river water. It was ordered that testimony be taken before a stenographic commissioner, and over a period of several years at numerous hearings testimony was so taken, and many exhibits were introduced. After both parties had rested, Colorado filed a motion for the appointment of a Special Master and for permission to introduce further testimony. On May 4, 1942, the Court appointed the Honorable Charles C. Cavanah Special Master and referred to him the motion for introduction of further testimony. The Court ordered (316 U. S. 645, 62 S. Ct. 1102):

> "The Master is directed to examine the evidence already taken in the cause and any further evidence that may be taken, to make findings of fact and con-

clusions of law, and to submit the same to this Court with all convenient speed, together with his recommendations for a decree. The findings, conclusions and recommendations of the Master shall be subject to consideration, revision, or approval by the Court."

The Master permitted the taking of additional testimony (Report p. 2). After two hearings, the presentation of briefs, and oral arguments, the Master made his Report. Pursuant to the order of this Court entered May 24, 1943, exceptions to the Report have been filed by all parties.

To summarize the Master's report, he found in favor of Colorado on the question of the injunction against the further prosecution of the pending lower federal court cases mentioned in the complaint. The defendants have filed no exceptions to his action in this regard. The Master then found in favor of Kansas on the issue presented by the cross-bill and proceeded to recommend an apportionment of the water supply between the states. Colorado has excepted to the finding and conclusion that an apportionment is necessary. All parties have excepted to the recommended plan of apportionment.

The Court has indicated through its Clerk that it would not require the printing of the voluminous record in this cause. Consequently, no designations have been filed, and none of the record is printed. The determination of many of the exceptions of Colorado requires no reference to the record as the points raised clearly appear on the face of the Report of the Master. In order that the Court might have available a condensed statement of those factual matters which Colorado believes of importance and in order that this brief may be not unduly lengthened, the complainant is submitting herewith, as Appendix A, a review of the evidence. There are in the record as exhibits many maps, graphs, compilations of statistics, and engineering analyses. Appendix B submitted herewith contains reproductions of what the complainant deems important exhibits.

2. Physical Features of Arkansas River Basin.

The Arkansas river has its headwaters high in the Rocky Mountains of central Colorado. For about 130 miles by river, in its course through Lake, Chaffee and western Fremont counties, it is a typical mountain torrent, descending rapidly with a gradient of 40 feet per mile (Colo. Ex. 9). It emerges from the mountains at the Royal Gorge, west of Canon City, flows across a foothill region to Pueblo, and thence traverses the high plains of Eastern Colorado. Across Kansas, the river takes a meandering course and leaves that state at the south central boundary to flow through Oklahoma and Arkansas and join the Mississippi near the southeastern corner of the latter state.

In its course through Colorado and Kansas, the Arkansas is non-navigable (Report p. 4).[1] The drainage area in Colorado is 24,628 square miles and in Kansas 22,195 square miles (Colo. Exs. 31, 205, Tr. p. 411). The river length in Colorado is 320 miles and in Kansas 390 miles (Report p. 5). The headwater branches of the Arkansas extend up to elevations of 10,000 to 14,000 feet above sea level (Tr. p. 347). At Canon City the altitude is 5,363 feet (Tr. p. 505); at the state line 3,345 feet (Tr. p. 506); and at the southern boundary of Kansas 1,000 feet (Tr. p. 506). At the crests of the mountain ranges the precipitation is from 20 to 30 inches annually, much of which is in the form of snow (Colo. Ex. 202, App. B, p. 52). The last mentioned exhibit shows that in the sheltered mountain valleys, as at Buena Vista and Salida, the annual precipitation is 10-12 inches, and that the precipitation increases across the plains from 11 inches at Pueblo and 14 inches at Lamar to 17 inches at Syracuse, Kansas, 18 inches at Garden City, Kansas and 19 inches at Dodge City, Kansas (App. A, p. 56). Temperature increases as one travels eastward from the mountains and in Kansas the average mean temperature is two to five degrees higher than in eastern Colorado (Colo. Ex. 191). Wind velocities

[1] This fact was conceded by the United States in its Petition in Intervention filed in *Kansas v. Colorado*, 206 U. S. 46, 54.

are higher in western Kansas than in eastern Colorado (Tr. p. 6690).

In Colorado the principal towns or cities located along the Arkansas after it leaves the mountains are, listed in down stream order with their populations as given in the 1940 census, Canon City 6,690, Pueblo 52,162, Rocky Ford 3,494, La Junta 7,040, Las Animas 3,232, Lamar 4,445, Holly 864; and in western Kansas in the Arkansas basin there are Syracuse 1,226, Garden City 6,285, and Dodge City 8,487. Approximately 150,000 people live in the cities, towns and villages of the Arkansas basin in Colorado and an additional 50,000 people are located on farms and agricultural lands (Complaint p. 7).

Irrigation has been practiced along the Arkansas in Colorado for over eighty years[2]. A summary of Kansas Ex. 2 (Tr. p. 908, App. A, pp. 67-72) shows the following adjudicated direct flow water rights in the main stem of the Arkansas river in Colorado.

Water Districts	Quantities in Cubic Feet per Second Senior[3] to 1894	1894 and Later	Combined Totals
11	363.02	31.07	394.09
12	521.43	27.23	548.66
14	2,024.44	7.00	2,031.44
17	2,399.60	401.72	2,801.32
67	1,552.35	87.20	1,639.55
Totals	6,860.84	554.22	7,415.06

The total decreed capacity of the approximately 200 storage reservoirs along the Arkansas and its tributaries in Colorado is 653,427 acre-feet.[4] Of this total capacity 589,018 acre-feet, or more than 90% bear dates senior to the year 1910 (App. A, p. 66).

The 1940 United States Census shows an irrigated

[2]The earliest priority is dated 1859 (Kans. Ex. 2).

[3]The significance of the date 1894 is that all direct flow ditches diverting from the main stem of the river were constructed prior to that year.

[4]This total is exclusive of the capacity of Caddoa reservoir, of the unavailable decreed capacity in the Great Plains reservoirs, and of conditionally decreed rights which have not been perfected by construction.

acreage in the Arkansas basin in Colorado of 469,535 acres (Tr. p. 6823, Colo. Ex. 196).

Construction of ditches in Kansas for irrigation from the Arkansas river began about 1880. There are eight ditches in Finney, Kearney and Hamilton counties, Kansas. Five of these in Finney and Kearney counties constitute what is known as the Garden City group and three in Hamilton county the Syracuse or state line group (Tr. pp. 3623-3635). There is but one storage reservoir for irrigation in western Kansas, Lake McKinnie which was constructed in 1907 or 1908 (Tr. p. 3704) and has a capacity of 25,800 acre-feet of which but about 18,000 acre-feet are used (Tr. p. 3313).

The Sixteenth U. S. Census for 1940 shows the irrigated acreage in Hamilton, Kearney and Finney counties Kansas to be 56,341 acres. All Kansas irrigation east of these counties is from wells or pumps and not from surface diversions from the river (Tr. p. 3546). Colorado witness Patterson testified that an investigation made under his supervision showed that in the three named Kansas counties the irrigated acreage was 59,632 of which only 22,428 acres were dependent exclusively on the surface flows of the Arkansas River, the remaining acreage having supplemental supplies by means of wells and pumps (Tr. p. 6561).

The physical conditions and the relative need for irrigation in the two states were thus summarized by this Court in its 1907 decision (*Kansas v. Colorado, supra,* p. 109):

> "It may be asked why cultivation in Colorado without irrigation may not have the same effect that has attended the cultivation in Kansas west of where it was productive when the territory was first settled. It may possibly have such effect to some degree, but it must be remembered that the land in Colorado is many hundred feet in elevation above that in Kansas; that large portions of it are absolutely destitute of sod, and that cultivation would have comparatively

little effect upon the retention of water. Add further the fact that the rainfall in Colorado is less than that in Kansas, and it would seem almost certain that reliance upon mere cultivation of the soil would not have anything like the effect in Colorado that it has had in Kansas, and that the barrenness which characterized portions of this territory of Colorado would have continued for an indefinite time unless relieved by irrigation."

3. The Former Case Between Kansas and Colorado.

The controversy between Kansas and Colorado over the Arkansas river is of long standing. In 1901 Kansas brought an original suit against Colorado and certain of its water users in this Court, alleging that Colorado had depleted the flow of the stream to the damage of the common law riparian rights of Kansas (206 U. S. 50-53, 85, 98). Colorado contended, among other things, that it had the right to use as it saw fit all the water of the stream within its borders (206 U. S. 85, 98). The United States intervened, asserting that the Federal government had the right to control the flow of interstate streams (206 U. S. 56-57, 85).

After the taking of voluminous testimony before a commissioner, this Court in 1907 handed down a decision which, as the first pronouncement of the rule of equitable apportionment, has long been recognized as a landmark in the field of interstate water controversies. After determining that it had jurisdiction of the case, the Court first disposed of the claim of national control adversely to the United States. This portion of the decision is concluded with the following statement (206 U. S. 93):

> "It is enough for the purposes of this case that each state has full jurisdiction over the lands within its borders, including the beds of streams and other waters."

The Court then reviewed the physical conditions in

the Arkansas river basin (206 U. S. 105-108). Tables of population, cultivated acreage and value of farm products in the Colorado section of the basin were given and the Court summarized the Colorado situation thus (206 U. S. 109):

> "These tables disclose a very marked development in the population, area of land cultivated, and amount of agricultural products. *Whatever has been effective in bringing about this development is certainly entitled to recognition, and should not be wantonly or unnecessarily destroyed or interfered with.*[5] That this development is largely owing to irrigation is something of which, from a consideration of the testimony, there can be no reasonable doubt. It has been a prime factor in securing this result, and before, at the instance of a sister state, *this effective cause of Colorado's development is destroyed or materially interfered with, it should be clear that such sister state has not merely some technical right, but also a right with a corresponding benefit.*"

Similar tables of population and farm production are given for Kansas, and the Court then said (206 U. S. 113):

> "These are official figures taken from the United States census reports, and they tend strongly to show that the withdrawal of the water in Colorado for purposes of irrigation has not proved a source of serious detriment to the Kansas counties along the Arkansas river. It is not strange that the western counties show the least development, for, being nearest the irrigation in Colorado, they would be most affected thereby. At one time there were some irrigating ditches in these western counties, which promised to be valuable in supplying water, and thus increasing the productiveness of the lands in the vicinity of the stream *and it is true that those ditches have ceased to be of much value, the flow in them having largely diminished.*

[5] All italics in this brief are supplied by the author.

"It cannot be denied, in view of all the testimony * * *, that the diminution of the flow of water in the river by the irrigation of Colorado has worked some detriment to the southwestern part of Kansas, and yet, when we compare the amount of this detriment with the great benefit which has obviously resulted to the counties in Colorado, it would seem that equality of right and equity between the two states forbids any interference with the present withdrawal of water in Colorado for purposes of irrigation."

The Court thus summarized its conclusions (206 U. S. 117):

"Summing up our conclusions, we are of the opinion that the contention of Colorado of two streams cannot be sustained; that the appropriation of the waters of the Arkansas by Colorado, for purposes of irrigation, has diminished the flow of water into the state of Kansas; that the result of that appropriation has been the reclamation of large areas in Colorado, transforming thousands of acres into fertile fields and rendering possible their occupation and cultivation when otherwise they would have continued barren and unoccupied; *that while the influence of such diminution has been of perceptible injury to portions of the Arkansas valley in Kansas, particularly those portions closest to the Colorado line, yet, to the great body of the valley it has worked little, if any, detriment, and regarding the interests of both states, and the right of each to receive benefit through irrigation and in any other manner from the waters of this stream, we are not satisfied that Kansas has made out a case entitling it to a decree.* At the same time it is obvious that if the depletion of the waters of the river by Colorado continues to increase there will come a time when Kansas may justly say that there is no longer an equitable division of benefits and may rightfully call for relief against the action of Colorado, its corpora-

tions and citizens in appropriating the waters of the Arkansas for irrigation purposes."

The following direction was made with reference to the entry of a decree (206 U. S. 117):

> "The decree which, therefore, will be entered, will be one dismissing the petition of the intervener, without prejudice to the rights of the United States to take such action as it shall deem necessary to preserve or improve the navigability of the Arkansas river. The decree will also dismiss the bill of the state of Kansas as against all defendants, without prejudice to the right of the plaintiff to institute new proceedings *whenever it shall appear that, through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river.*"

4. The Interstate Controversy Since the 1907 Decision in Kansas v. Colorado.

It will be remembered that in its decision in *Kansas v. Colorado* this Court stated that the irrigating ditches in the western counties of Kansas "have ceased to be of much value, the flow in them having largely diminished" (206 U. S. 113). This holding conformed to the allegation by Kansas in its bill of complaint that "the water for the irrigation ditches in the western part of Kansas has been entirely cut off" (206 U. S. 52).

Since the basis of the Kansas demand in this cause is the need for Arkansas river water to irrigate land in western Kansas, and since by its 1907 decision the Court left the door open for Kansas to sue for relief when a material increase in the depletion of the basin water supply by Colorado should result in injury to the substantial interests in Kansas (206 U. S. 117), it is well to consider

what has transpired since 1907 in connection with the Kansas ditches and their demands against Colorado and its water users.

(a) Kansas Rotation Agreement.

On August 30, 1908, The Finney County Water Users' Association, one of the defendants herein and the owner of the Farmers ditch, brought in the district court of Kearney county, Kansas, a suit, which later was removed to the United States Circuit Court, for an adjudication, on a priority basis, of all ditches diverting from the Arkansas river in Kansas (Tr. pp. 3530-3539). This intrastate controversy was settled by a stipulation dated May 16, 1911, under which the divertible waters of the Arkansas river were to be divided between, and rotated among, the ditches in Kearney and Finney counties in certain stated proportions until the determination of a suit brought by The United States Irrigating Company against certain Colorado water users in the United States Circuit Court for Colorado. Thereafter, the divertible waters of the Arkansas river, including the supplies expected to be acquired from the Colorado ditches, were to be divided, distributed and rotated in the following proportions and amounts (Tr. p. 3534): to the Garden City ditch 2/21st, 1,500 acre-feet; to the Farmers ditch 5/21st, 3,750 acre-feet; to the Great Eastern ditch 6/21st, 4,500 acre-feet; to the South Side ditch 4/21st, 3,000 acre-feet; and to the Amazon ditch 4/21st, 3,000 acre-feet (App. A, pp. 134-135). Under the stipulation and decree a distributing officer or water bailiff was appointed by the court to distribute the stream flows among the five ditches in the stated proportions. This officer was later replaced by an agency of the state.

(b) The 1916 Settlement.

On August 27, 1910, The United States Irrigating Company, owner of the Great Eastern, Garden City, and Amazon ditches brought suit in the United States Circuit

Court for Colorado against certain Colorado water users to procure a decree establishing its claimed legal title by priority date and amount, regardless of state lines, as against the priorities and rights of the defendant Colorado appropriators awarded to them by the courts of the State of Colorado. In this proceeding The Finney County Water Users' Association sought unsuccessfully to intervene (Colo. Ex. 149, Tr. p. 3518). After the presentation of complainant's testimony, and prior to the introduction of evidence on behalf of the defendant Colorado water users, this case was settled by a contract dated February 19, 1916 (Colo. Ex. 148, Tr. p. 3517, App. A, pp. 135-136).

Under the terms of this settlement contract, the Colorado defendants agreed:

(1) To recognize priorities as of date August 27, 1910 in the following Kansas ditches: The Amazon, the South Side, the Great Eastern and the Garden City.[6]

(2) Not to apply for or claim priorities for storage purposes on the Purgatoire river, or on the Arkansas river below the mouth of the Purgatoire river, of a date earlier than August 27, 1910;

(3) To pay the costs of the suit;

(4) To pay the signatory Kansas interests fifty cents per acre then being irrigated by the Colorado defendants and the further sum of $30,000.00.

The Kansas ditches agreed to accept the priority date as of August 27, 1910, and the quantities of water specified in the contract, as a definition and determination of their relative rights as against the rights of appropriators in Colorado taking water from the Arkansas river and its tributaries.

The Colorado defendants made the required payments

[6] These are all the irrigation enterprises in Kearney and Finney counties, Kansas, except the Farmers ditch of The Finney County Water Users' Association which declined to be a party to the contract.

and otherwise complied with the terms of the settlement contract (Tr. p. 3517).

(c) The Suits Brought by The Finney County Water Users' Association.

The Finney County Water Users' Association declined to be a party to the 1916 settlement and in November of that year brought suit in the United States District Court against the same Colorado defendants and for the same purposes as the suit of The United States Irrigating Company. Several years later a similar action was brought against other Colorado water users (Colo. Exs. 2 and 3, Tr. pp. 9-11). Both suits, herein referred to as the Finney County cases, sought to establish on the Arkansas river a system of interstate administration based on individual priorities regardless of state lines.

The case now before this Court seeks to enjoin the further prosecution of these two Finney County cases.

5. The Pleadings in the Case at Bar.

(a) The Complaint.

The complaint in Paragraphs Third and Fourth describes the valley of the Arkansas river in both states. In Paragraphs Fifth, Sixth and Seventh are set forth the principles, legal and administrative, adopted by Colorado to govern the control and utilization of the waters in the state. Then follows, Paragraphs Eighth and Ninth, an outline of the issues raised in the case of *Kansas v. Colorado* and a summation of the decision of this Court rendered May 13, 1907.

Paragraph Tenth contains a statement of the position of Colorado with reference to the dependence of its citizens living in the Arkansas valley upon the waters of the river and the reliance which was placed upon the determination of this Court in the *Kansas v. Colorado* case that Colorado was not then using more than its equitable share of the waters of the river and that Kansas was given

the right to reopen the controversy only when by a material increase of the depletion of the waters of the river there was an injury to the substantial interests of Kansas. The allegation is made that in reliance upon this decision enormous sums of money were spent upon the improvement of the irrigation systems dependent upon the water supply of the Arkansas river system. Then follows a statement as to the acts of the Kansas water users in continuing to file suits against the Colorado waters users, notwithstanding, and in defiance of, the decision of this Court in *Kansas v. Colorado.*

Paragraph Fourteenth avers the effect upon Colorado and its water users of a determination favorable to the plaintiff in the Finney County cases pending in the federal court. It is alleged that the establishment of an interstate priority schedule would utterly disrupt and destroy water administration in the Arkansas basin in Colorado by upsetting the relationship between Colorado priorities determined under Colorado law by requiring the establishment of separate administrative officers to enforce any decree with the result that there would be conflicts of authority with state officers. It is stated that any attempt to enforce individual recognition of a selected appropriator in Kansas, such as The Finney County Water Users' Association, as against a few selected appropriators in Colorado[1] would be destructive of public order, and would be utterly impossible of intelligent administration or obedience and would produce great waste and destruction of the water resources of the basin.

In Paragraph Seventeenth it is alleged, among other things, that:

"Notwithstanding the solemn determination therein entered into (*Kansas v. Colorado*), citizens of the State of Kansas, by their action have placed the State of Kansas in the position of acquiescing in private

[1]Not all Colorado appropriators are named as defendants in the two Finney County cases.

litigation in which it has nothing to lose and everything to gain, the result whereof might be to set aside the effects of the said determination between the states of Kansas and Colorado and thereby to place Kansas in the position of gaining by guerrilla warfare what it is forbidden to assert openly and officially and as a sovereign, and to enable its citizens, by a favorable decision in the lower Federal courts, to lay a perpetual servitude on the territory of the State of Colorado to be thereafter maintained and perpetuated without the consent of Colorado, without consideration of her dignity as a sovereign state, in total disregard of her domestic policy and system of administration, and in defiance of the solemn adjudication made in the case of Kansas against Colorado in 1907."

The Eighteenth Paragraph sets forth the annoyance, harassment and expense caused the Colorado water users by the Finney County cases and states that since no appeal lies as of right to the Supreme Court of the United States, the sovereignty of Colorado with respect to the waters of the Arkansas basin is threatened with adjudication in the lower federal courts without recourse, as of right, to the Supreme Court, the only tribunal rightfully empowered to determine the same.

In the Nineteenth Paragraph of the complaint there are set forth several ways in which the continuance of the Finney County cases will affect Colorado, viz: To allow a lower federal court to usurp the functions of the Supreme Court and adjudicate the sovereign rights of a state in violation of the Eleventh Amendment; to impose on Colorado a perpetual servitude without a decision of this Court; to remove the sovereign control of Colorado over diversions of water in the Arkansas basin in Colorado; to repudiate the decision in *Kansas v. Colorado* and deprive Colorado of the peace and security resulting from that decision; to determine relative usufructuary relations between water users in two states having wholly different laws pertaining to water; to impose upon Colorado, as a

necessary means of enforcing a decree, a body of officials which will usurp the functions of the state administrative officers and finally:

> "(o) To confuse and intermingle forever the respective jurisdictions of the State and Federal governments and also of the judicial and executive branches of both governments, and as a result thereof to hamper and perhaps destroy the orderly evolution of agriculture, industry and human population in the Arkansas Valley."

The relief sought by Colorado is that The Finney County Water Users' Association be enjoined from further prosecution of the pending suits against citizens of Colorado; that the State of Kansas and its other citizens be enjoined from litigating or attempting to litigate the relative rights of the two states and their citizens to the waters of the Arkansas river on the same or similar claims; and that the rights of the State of Colorado and its citizens as fixed and determined by the judgment in the case of *Kansas v. Colorado* be protected.

(b) The Answer of the State of Kansas.

The first 21 paragraphs of the Kansas answer consist of admissions and denials. The admissions are largely as to the physical situation of the Arkansas river and the pendency of the Finney County cases referred to in the Colorado complaint. Substantially all other matters in the complaint are denied. The real substance of the Kansas answer is found in Paragraph Twenty-second which is in effect a cross-bill, although it is not so denominated. In this paragraph counsel describe at length the Arkansas river as it flows through Kansas, set forth the climatic, geographic and hydrographic conditions in the basin of the river in Kansas and outline the development of irrigation in Kansas, listing and describing the irrigation enterprises constructed and claimed to have been operated in Kansas. It is averred that from the year 1880 to the

date of the filing of the bill in this case, Colorado and its water users have appropriated and diverted from the river and withheld from Kansas large quantities of water to which Kansas and its citizens were entitled, to the great injury of irrigated agriculture in Kansas; that many of the appropriations of water by Colorado water users were junior in time and inferior in right to the appropriations made by the water users of Kansas; and that Colorado water users have since May 20, 1901, the date of the filing of the complaint in *Kansas v. Colorado*, largely increased their appropriations and diversions and threaten to still further increase them to the great injury of the Kansas water users.

Kansas prays that the Court protect and quiet the rights of the State of Kansas, its citizens and residents, to their appropriations of water from the Arkansas river for irrigation of lands in Kansas and likewise protect and quiet the right of the defendant The Finney County Water Users' Association to the taking or appropriating of water; that the rights of the residents or citizens of Kansas to divert water from the Arkansas river for the purpose of irrigation be decreed in second feet; and that the State of Colorado, its officers, agents and citizens, be perpetually enjoined from diverting any water from the Arkansas river or its tributaries in Colorado until the rights of the citizens of Kansas shall be satisfied.

(c) Answer of The Finney County Water Users' Association.

The defendant The Finney County Water Users' Association filed a separate answer which is very similar to the answer of the State of Kansas. However, it incorporates the additional averment that it was not a party to the suit of *Kansas v. Colorado* and was, therefore, not bound by that decision. It contends that its right of priority for the Farmers ditch was not adjudicated in the previous litigation and further that Kansas is not a riparian state but, under certain statutes specifically re-

ferred to, the doctrine of priority of appropriation is controlling in that state.

The Finney County Water Users' Association also seeks affirmative relief under Paragraph Twenty-second of its answer. It is there alleged that it is the owner of the Farmers' ditch which was constructed in December, 1880 for the purpose of irrigating from 15,000 to 20,000 acres of land and which now is, and has been, capable of irrigating from 8,000 to 10,000 acres; that as of the date of December, 1880, this ditch appropriated 250 second feet of water from the Arkansas river for which it claims a priority of right to the use as of the aforesaid date as against all junior appropriators in Colorado.

The prayer of the Finney County answer is that Colorado and all of its citizens diverting water from the Arkansas river and its tributaries be perpetually enjoined from diverting any water from the Arkansas river in Colorado until its rights to 250 second feet shall be satisfied.

(d) Reply of the State of Colorado.

The reply of Colorado sets out the position of Colorado with relation to the respective claims of, and rights to, the waters of the river in the two states. The reply is divided into four subdivisions.

Subdivision I consists largely of denials of the averments contained in the answers.

Subdivision II is a recital of the history of the case of *Kansas v. Colorado* and an analysis of the judgment rendered by this Court in that case on May 13, 1907. In this portion of the reply it is asserted that the decree rendered in the former case finally adjudicated and determined, adversely to the State of Kansas, all the claims now made by that state and its citizens in the instant case.

Subdivision III consists of a plea that the State of Colorado in its sovereign capacity represents and speaks for all the water users within that state with derivative

rights from that state and that each thereof would be bound by any adjudication or determination of the issues herein involved.

Subdivision IV sets out the position taken by Colorado as to its right to the use of the waters of the river and the various reasons why Kansas and its citizens cannot now be heard to assert the claims contained in the prayers for affirmative relief.

(e) The Issues as Defined by the Pleadings.

The three main issues presented by the pleadings are:

(1) Is Colorado entitled to an injunction against the further prosecution in a lower federal court of the cases brought by a Kansas water user against Colorado water users?

(2) Has Colorado destroyed or threatened to destroy the equitable apportionment of the benefits from the flow of the stream which this Court by its decision in *Kansas v. Colorado* found had not been impaired by Colorado at that time?

(3) If the answer to (2) is in the affirmative, what is an equitable apportionment between the states?

On the first of these issues the Special Master found in favor of Colorado and the defendants have filed no exception to this portion of his Report.

On the second issue the Special Master found in favor of Kansas, and Colorado has excepted to his Report in this regard.

On the third issue the Special Master attempted to make an equitable apportionment, and all parties have excepted to this phase of his Report.

6. The Evidence.

The appendices to this brief are intended to present, from the standpoint of Colorado, a statement of the per-

tinent and controlling testimony and exhibits. Accordingly, no review of the evidence will be made here.

7. The Stipulation of 1933.

It has been pointed out that under the settlement contract of 1916 the Colorado water users agreed to certain limitations on the construction of storage reservoirs on the Arkansas river below the mouth of the Purgatoire river.[8]

In 1933 the construction of Caddoa Dam and Reservoir by the Corps of Engineers of the United States Army was proposed. Colorado took the position that because of the 1916 settlement it could not actively participate in any move for the construction of Caddoa without some further agreement with Kansas. Accordingly, on December 18, 1933 a stipulation was signed by the Governors, the Attorneys General, the Special Counsel and the Engineers of the two states. This document was later introduced in evidence as a joint exhibit, Kans. Ex. 129, Colo. Ex. 179 (Tr. p. 6053, App. A, pp. 138-141, App. B, pp. 30-35). Briefly the parties agreed to use their influence to obtain the construction of the reservoir and provided for the allocation of water as follows (Stipulation, Section Two):

> "That the construction and operation of said dam and reservoir shall not disturb the status quo of the diversion of water for beneficial uses from said Arkansas River by the ditches and canals now constructed and operated in both of the states of Colorado and Kansas. IT IS UNDERSTOOD AND AGREED that in order to maintain the status quo of said diversions as hereinabove referred to there shall be allocated to the State of Kansas for delivery at the State line in the Arkansas River from Colorado into Kansas a quantity of water up to 77,000 acre-feet annually, of which amount 52,000 acre-feet thereof shall be delivered to the State line during the irrigation season from April 1 to October 1 of each year as and when required by

[8] The Purgatoire river is known locally, and sometimes referred to in the record, as the Picketwire river.

the Kansas state water officials, and 25,000 acre-feet thereof to be delivered during the non-irrigating season from October 1 to April 1 at such times and in such amounts as same could be diverted and used for irrigation or storage; and for irrigation of lands in Colorado below said reservoir a quantity of water up to 160,000 acre-feet annually."

Section Three provides for a proration of the supply at times of deficiency.

Section Four allocates surplus water and reads thus:

"After the allocation of water as provided in the next preceding paragraphs, all additional water which may be impounded in said reservoir, excepting, always the amounts of water discharged for flood control purposes, hereinafter referred to, shall constitute surplus and shall be allocated one-half to Colorado and one-half to Kansas, said surplus to be determined April 1, annually, or such other date as may be mutually agreed upon by water officials of the two States, and the amount allocated to each State shall be discharged from said reservoir from time to time on request of the Water Officials of each State respectively for the water allocated to it, but the release of such water on demand shall not be considered as constituting any part of the amounts specified in paragraph 2 herein."

Section Eight provides as follows:

"This Stipulation is without prejudice to the claims of either part hereto in the above entitled case, and shall be subject to the decision of the Supreme Court of the United States as to the respective rights of the parties hereto to water flowing in the Arkansas River, or stored in said reservoir."

The Master in his Recommended Decree (Paragraph Six, p. 21) says that this stipulation is not binding upon the two states. Without going into a discussion of such matters at this time, it may be said that there is nothing

in the record or in the report of the Master indicating that there has been any change of conditions along the Arkansas river since 1933 which makes inequitable now an allocation which was equitable then.

8. Caddoa Reservoir.

The construction of Caddoa Dam and Reservoir* by the Corps of Engineers of the United States Army was authorized by the Flood Control Act of June 22, 1936 (49 Stat. 570). Appropriation of funds for construction was made in the Flood Control Act of 1938 (52 Stat. 1215). The cost is borne entirely by the United States. The dam is located across the channel of the Arkansas river about 58 miles above the state line. Work was begun in 1940 and has been completed except for the flood release gates which heretofore have not been obtainable because the necessary priorities for steel have been denied to the project during the present war emergency. Plans contemplate a reservoir with a total capacity of 655,000 acre-feet, of which 385,000 acre-feet constitute a conservation pool (Tr. pp. 6576-77). The present available capacity in the absence of the flood release gates is 270,000 acre-feet. Since the closing of the testimony in the case 100,000 acre-feet of the presently available capacity is, under a temporary arrangement of the Corps of Engineers, being used for conservation storage. Maintenance and operation of the flood pool of the reservoir are "under the supervision" of the War Department, Corps of Engineers, United States Army (52 Stat. 1215). Conservation storage must be in conformity with Colorado law and as permitted by the Corps of Engineers.

SPECIFICATION OF POINTS TO BE URGED

The complainant, the State of Colorado, contends:

1. The suits brought by the defendant The Finney County Water Users' Association against Colorado water users in the federal district court for

*The official name of this project is now John Martin Reservoir Project (54 Stat. 505-508).

the District of Colorado should be enjoined because the equitable apportionment of the benefits arising from the flow of the Arkansas river must be and has been determined by this Court in an original interstate suit.

2. The defendants' cross-bill which seeks to obtain a redefinition of the equitable apportionment between the states by a relitigation of the issues presented in the original suit of *Kansas v. Colorado* should be dismissed because Colorado has not by the use of more than its equitable share of the flow of the stream inflicted any injury on the defendants.

3. The issues presented, and determined by this Court, in the case of *Kansas v. Colorado* should not be relitigated in this case.

4. The Report and the Recommended Decree of the Special Master are contrary to the evidence and the law, are ambiguous, uncertain and unworkable, and reflect a lack of understanding of, and superficial treatment of, the issues.

5. The effect of the Master's Report, as interpreted by Kansas, is to award to Kansas more than its equitable share of the benefits arising from the flow of the interstate stream.

6. If any change in the 1907 decree of equitable apportionment is to be made, then the provisions of the stipulation, executed in 1933 by the officials and representatives of the parties and filed in this case, should be given effect.

SUMMARY OF THE ARGUMENT

The argument for Colorado may be summarized thus:

(1) The injunction sought by Colorado against the further prosecution of the Finney County cases should be granted.

(2) There is no showing that through a material increase in the depletion of the waters of the Arkansas by Colo-

rado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of the benefits between the two states resulting from the flow of the river.

(a) To maintain its cross-bill Kansas must sustain the burden of showing (1) that since the decision in *Kansas v. Colorado* there has been a material increase in the depletion of the waters of the river by Colorado and its water users and (2) that this has resulted in injury to the substantial interests of Kansas.

(b) There has been no material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, since the decision in *Kansas v. Colorado.*

(i) The records of Colorado diversions and return flows show conclusively that since 1907 Colorado has not increased materially the depletion of the flow of the stream.

(ii) Since the decision in *Kansas v. Colorado* there has been no diminution in the amount of state line flow divertible and usable for irrigation in Kansas.

(iii) Since the decision in *Kansas v. Colorado* the quantities of water diverted and used by the Kansas irrigation ditches have materially increased.

(c) There has been no injury to the substantial interests of Kansas.

(i) Population.

(ii) Agricultural Production.

(iii) Irrigated Acreage.

(iv) The great body of the valley in Kansas has not been injured.

(d) Since Kansas has not been injured, no affirmative decree should be entered against Colorado under the cross-bill.

(e) The finding of the Special Master as to stream depletion and injury is contrary to the evidence and the law and should not be accepted or followed by the Court.

(3) The report of the Special Master is so ambiguous, inconsistent and confusing that it is impossible to determine how much water is apportioned to each state and how the stream is to be administered to effectuate such an apportionment.

(a) The Master misconceives the problems inherent in an apportionment between states of a fluctuating water supply such as that of the Arkansas river.

(b) The findings of the Master with relation to the water supply are based upon estimates and are of no practical value.

(c) The recommendations of the Master as to measuring stations reflect a misconception of the existing conditions.

(d) The recommendations of the Master as to the proportionate division between states are uncertain.

(e) The recommendations of the Master with relation to flood waters are uncertain and afford no workable plan for the apportionment of such flood waters.

(f) The Master's recommended decree conflicts with his findings of fact and conclusions of law as to the delivery of water and is unworkable and grossly unfair to the State of Colorado.

(4) The apportionment recommended by the Master allocates to Kansas more than its equitable share of the benefits of the flow of the interstate stream.

(a) The nature of equitable apportionment.

(b) The report of the Master shows on its face that the recommended apportionment would result in taking water from established Colorado uses for Kansas lands that are not now irrigated.

(c) The award of water to Kansas for use in possible future development is improper as it constitutes the recognition of an inchoate right.

(d) The award recommended to be made to Kansas is excessive since Kansas is not now making full use of the water which it has.

(e) The recommended apportionment is inequitable since it utterly disregards the 1916 Settlement and the Stipulation of 1933.

(i) The 1916 Settlement.

(ii) The 1933 Stipulation.

(f) The recommended apportionment would require Colorado to forego present uses in order to deliver water to Kansas at the state line.

(i) Under historical conditions substantial deficiencies would have occurred in state line flows if the recommendation of the Master as interpreted by Kansas had been in effect.

(ii) There is no relationship between the so-called index flows and the state line flow.

(g) While Kansas claims additional water from Colorado for irrigation, the Kansas law is such that there is no assurance that additional water can or will be so used.

(5) The existence and effect of Caddoa reservoir on the regimen of the flow of the stream must be recognized.

(a) A description of Caddoa reservoir.

(b) The Master ignores the effect of Caddoa reservoir.

(c) The Stipulation of 1933 affords a basis of using

Caddoa reservoir to preserve the existing uses and to divide equally the potential conservation benefits.

(6) In numerous minor matters the Report of the Master is either incomplete or incorrect and hence should not be accepted.

(a) The provisions of the Recommended Decree that the states each own certain quantities of water are erroneous.

(b) A decree should not require the measurement of Colorado ditch diversions.

(c) The findings of the Master are incomplete in many particulars.

(7) The defendants' Exceptions to the Report and Recommendation of the Special Master amount to an attempt to rewrite the Report and are without support in the evidence and are unfair to Colorado.

(a) The defendants' theory of rewriting the Report and Decree with changes favorable to their interests is wrong in theory and unsupported by the evidence and the law.

(b) The scheme of apportionment contained in the Kansas exceptions is inequitable.

(c) The Kansas theory ignores the question of conveyance losses between the index stations and state line.

(d) Kansas is inconsistent in claiming a percentage of the index flows as they accrue and in also claiming that the water be delivered when required.

(e) The Kansas position with relation to flood water is unfair.

(8) If a decree of apportionment is to be made, it should follow the 1933 Stipulation.

ARGUMENT

I.

THE INJUNCTION SOUGHT BY COLORADO AGAINST THE FURTHER PROSECUTION OF THE FINNEY COUNTY CASES SHOULD BE GRANTED.

The gravamen of the Colorado complaint in this case is that, for the protection against harassment of its water users and for the maintenance and safeguarding of its quasi-sovereign control over the administration of the waters flowing within its borders, the prosecution in the United States District Court for the District of Colorado of the two Finney County cases should be enjoined. In support of this position Colorado says:

(a) The decision of this Court in *Kansas v. Colorado* made an equitable apportionment between the states of the waters of the stream. On this point there can be no doubt. This Court has expressly recognized that such was the effect of its decision. We quote from *Hinderlider v. La Plata River and Cherry Creek Ditch Company*, 304 U. S. 92, 104-105:

> "The extent of the existing equitable right of Colorado and New Mexico in the La Plata River could obviously have been determined by a suit in this Court, *as was done in Kansas v. Colorado, supra, in respect to rights in the Arkansas River and in Wyoming v. Colorado, supra, in respect to the Laramie.*"

(b) The apportionment so made is binding upon the citizens of each state and all water-claimants. (*Hinderlider v. La Plata, supra*, p. 106) since the rights of the state are indissolubly linked with the rights of the appropriators (*Wyoming v. Colorado*, 259 U. S. 419, 468) and the states stand in judgment for all their appropriators (*Nebraska v. Wyoming*, 295 U. S. 40, 43).

It follows that the repeated attempts by Kansas water users to go behind the decision in *Kansas v. Colorado* must fail as they constitute efforts to avoid a decision of this

Court. No citation of authority is necessary on the proposition that one may not do indirectly what he cannot do directly.

Litigation in inferior courts by holders of rights derived from one state against others holding rights from the neighboring state injects an element of confusion and certainly, when the basic rights of the states have been determined by the final arbiter, such litigation is wholly improper. This Court has made an apportionment between Colorado and Kansas (206 U. S. 117).

As said in *Virginia v. West Virginia*, 246 U. S. 565, 591, 38 S. Ct. 400, 402, it is elementary that judicial power essentially involves the right to enforce the results of its exertion. The rule is that a federal district court, once having obtained jurisdiction of a controversy and having rendered a decision in the matter, has complete power to protect the judgment or decree which it has rendered, and may enjoin an action entertained in a state court by a litigant involving the same subject matter when such action may interfere with or nullify the effect of such judicial determination (*Holmes v. Rowe*, 97 F. (2d) 537, CCA 9th Cir.). The same rule should prevail when action in a lower federal court may interfere with or nullify a decision of the United States Supreme Court.

The cases of *Rickey Land and Cattle Company v. Miller and Lux*, 218 U. S. 258, 31 S. Ct. 11, *Bean v. Morris*, 221 U. S. 485, 31 S. Ct. 703 and *Weiland v. Pioneer Irrigation Company*, 259 U. S. 498, 42 S. Ct. 568 are not precedents against the position of Colorado. Each of these cases involved interstate priorities on small streams. In none of them was a state a party. Likewise in none of them had there been any apportionment, either by decision of this Court or by compact, between the states in which the individuals used the water. Individual interstate priorities are unimportant after such an aportionment is made because, then as pointed out in *Hinderlider v. La Plata, supra*, the question is whether or not a particular individual use is within the quantum allotted to the state.

In this phase of the case the Special Master agreed with Colorado. The matter is thus disposed of by Paragraph Seven of the Recommended Decree (Report, p. 22):

> "It is further considered, ordered and decreed that a permanent injunction is granted against the defendant The Finney County Water Users' Association and its officers, agents and representatives, enjoining the further prosecution of the two suits brought by it and now pending in the United States District Court in the State of Colorado, entitled, The Finney County Water User's Association against The Graham Ditch Company and others, and, The Finney County Water Users' Association against the Coler Ditch and Reservoir Company of Colorado and others, as whatever rights it or others in either the States of Colorado and Kansas may have to the use of said waters are indissolubly linked with those of the state in which they may be in the equitable apportionment of said water."

Neither of the defendants has taken any exceptions to this portion of the Recommended Decree or to Conclusion of Law Eight upon which it is based. We submit that Colorado is clearly entitled to the injunction prayed for in its bill of complaint.

2.

THERE IS NO SHOWING THAT THROUGH A MATERIAL INCREASE IN THE DEPLETION OF THE WATERS OF THE ARKANSAS BY COLORADO, ITS CORPORATIONS OR CITIZENS, THE SUBSTANTIAL INTERESTS OF KANSAS ARE BEING INJURED TO THE EXTENT OF DESTROYING THE EQUITABLE APPORTIONMENT OF THE BENEFITS BETWEEN THE TWO STATES RESULTING FROM THE FLOW OF THE RIVER.

(a) To Maintain its Cross-Bill Kansas Must Sustain The Burden of Showing (1) That Since the Decision in Kansas v. Colorado there has been a Material Increase in the Depletion of the Waters of the River by Colorado and its Water Users and (2) That This has Resulted in Injury to the Substantial Interests of Kansas.

By its affirmative defense, which is in effect a cross-bill, Kansas seeks a definition of its share of the waters of the river and an injunction forbidding Colorado uses until the Kansas rights are satisfied. In other words Kansas is taking advantage of the permission given by this Court in deciding *Kansas v. Colorado* for it to institute new proceedings. However, that permission is definitely and specifically qualified. This Court said (206 U. S. 117):

> "The decree will also dismiss the bill of the State of Kansas as against all the defendants, without prejudice to the right of the plaintiff to institute new proceedings whenever it shall appear that, through a material increase in the depletion of the waters of the Arkansas by Colorado, its corporations or citizens, the substantial interests of Kansas are being injured to the extent of destroying the equitable apportionment of benefits between the two states resulting from the flow of the river."

In the twenty-one years which elapsed between this decision and the institution of the present suit by Colorado, Kansas did not see fit to invoke the jurisdiction of this Court to litigate further its quarrel with Colorado. During this interval it was content to stand by and let its citizens carry on guerrilla warfare against the Colorado water users. When Colorado sought, by the bringing of this case, to end the harassment of this type of border war, then and only then did Kansas assert in this Court that it had been injured by Colorado since the termination of the former suit. Although Colorado here occupies the position of complainant, it is in reality defending its interests against the demands and attacks of aggressive neighbors.

By its 1907 decision this Court held that Colorado was not, by its water uses, exceeding its fair share of the benefits of the flow of the Arkansas. That decision is conclusive and final on the controversy as it then existed and it is conclusive now, unless Kansas makes the showing which the Court said would entitle it to renew the litigation. The burden is on Kansas to make that showing by clear and

convincing evidence (*New York v. New Jersey*, 256 U. S. 296, 309, 41 S. Ct. 492, 496) for this is a controversy between states and the burden and quantum of proof are governed accordingly (*Washington v. Oregon*, 297 U. S. 517, 529, 56 S. Ct. 540, 545). This Court has said that its jurisdiction in respect of controversies between states will not be exerted in the absence of absolute necessity (*Alabama v. Arizona*, 291 U. S. 286, 291, 54 S. Ct. 399, 401). The familiar and oft quoted rule is, as stated in *Missouri v. Illinois*, 200 U. S. 496, 521, 26 S. Ct. 268, 270:

> "Before this Court ought to intervene, the case should be of serious magnitude, clearly and fully proved, and the principle to be applied should be one which the court is prepared deliberately to maintain against all considerations on the other side."

The burden upon Kansas of sustaining its cross-bill is much greater than that imposed upon the complainant in an ordinary suit between private parties (*North Dakota v. Minnesota*, 263 U. S. 365, 374, 44 S. Ct. 138, 139; *Connecticut v. Massachusetts*, 282 U. S. 660, 669, 51 S. Ct. 286).

(b) There has been no Material Increase in the Depletion of the Waters of the Arkansas by Colorado, its Corporations or Citizens, since the Decision in Kansas v. Colorado.

The first condition imposed by the Court in its decision in *Kansas v. Colorado* upon the right of Kansas to institute new proceedings was that there be a material increase in the depletions of the waters of the stream by Colorado, its corporations or citizens. It is the position of Colorado that this condition has not occurred, and that there has been no material increase in the depletion of the waters of the interstate stream in Colorado since the decision in *Kansas v. Colorado*.

(i) The Records of Colorado Diversions and Return Flows show conclusively that since 1907 Colorado has not increased materially the Depletion of the Flow of the Stream.

Depletions are caused by diversions and uses of water, and are measured by the quantities of water which, after being diverted from the river, are not returned thereto but are consumed or otherwise withheld therefrom. Records of diversions and data concerning return flows are necessary from which to calculate, by subtraction, the quantities of water withheld from the river, i. e., depletions of the waters of the stream. Such information is available for the period beginning with 1904 for the river section from near Pueblo to the state line. Along this section are located the major ditches and the larger bodies of irrigated lands in the Arkansas river basin in Colorado. These records concerning diversions, returns and depletions may be summarized, as follows:[10]

Annual Diversions, Returns and Depletions
Arkansas River — Pueblo to State Line

(Period Averages in Acre-Feet)

Period	Diversions	Returns	Depletions
1904-1911	906,000	120,000	786,000
1912-1920	984,000	186,000	798,000
1921-1930	987,000	256,000	731,000
1931-1940	787,000		

It is apparent that, although total diversions increased 81,000 acre-feet per year when the 1904-1911 period is com-

[10]The periods were selected in recognition of the diversion records submitted as Kans. Ex. 7 and 7(a) to 7(s) for the years 1912-1931, which records were assembled from Daily Reports of the State of Colorado (Irrigation Division Engineer—Arkansas Valley Ditch Association). From the same source of information the diversion records were supplemented and completed by Colo. Exs. 91 to 98, for the years 1904-1911; Colo. Ex. 152 for the year 1932; also Colo. Ex. 98 and 98(a) for the years 1904 to 1932; and Colo. Ex. 194 (App. B, pp. 36-41) for the years 1921 to 1940. Aggregate diversions shown in the above table include all ditches below Pueblo, together with the Bessemer, Arkansas Valley Conduit, and miscellaneous ditches above Pueblo, but are exclusive of diversions of ditches in Fremont County, in the Canon City vicinity, which are excluded because records of return flows from such diversions are unavailable. The returns shown above are net river gains due to return seepage between Pueblo and the state line, as testified to by the witness Patterson at Transcript pages 883 to 885, and are in substantial agreement with values of 120,000 for 1910; 186,000 for 1912-1920; and 240,000 for 1921-1930, appearing in Kans. Ex. 32 (App. B, p. 72). Depletions are the differences between diversions and returns. Depletion values for 1931-1940 were not calculated because of the absence of testimony concerning return flow tests during that decade. See App. A, pp.81-85.

pared to the 1921-1930 period there was not an increase but a decline of 55,000 acre-feet in the depletion of the waters of the river in Colorado. This showing, based on records of diversions from and returns to the Arkansas river, has not been, nor can it be, disputed by Kansas.

(ii) Since the Decision in Kansas v. Colorado There has been No Diminution in the Amount of State Line Flow Divertible and Usable for Irrigation in Kansas.

Kansas by its cross-bill, and the Master by his report, deal solely with water for irrigation. Hence the character and amounts of state line flows are the best criteria as to whether or not there has been a material increase in the depletions of stream flow in Colorado. Kansas is not concerned with the use which is made of the waters of the interstate stream within the Colorado borders unless thereby the state line flows used for irrigation have been diminished in amount since the entry of the 1907 decree. Colorado insists that there has been no change in the character and no diminution of the amounts of the state line flows divertible and usable for irrigation in Kansas since the decision in *Kansas v. Colorado*.

There was no stream measuring station in the vicinity of the state line until the establishment by Colorado of such a station a few miles above the state line at Holly in October, 1907. This station has been maintained and operated in cooperation with the U. S. Geological Survey. Between the Holly station and the state line certain flows enter the river. Accordingly to arrive at a correct total flow across the state line it is necessary to add to the amounts measured at the Holly station the inflows from two tributaries, Wild Horse Creek and Cheyenne Creek, and from the Holly drain. The Holly drain, a Colorado enterprise, was constructed in 1923 to drain lands near Holly and delivers about 24,000 acre-feet of water annually (Tr. p. 3243). Though the Master in his report ignores these inflows below Holly, they were taken into account by the engineers

of both states.[11] It is believed that the defendants will not dispute the position taken by Colorado with respect to the inflows below Holly.

To determine whether or not the state line flows have diminished since the former decision a comparison should be made of the state line flows as they existed then and the state line flows as they are today. Turning first to a consideration of the flows at the time of the former decision, we find that this Court made no determination as to the amount of such flows. The absence of stream flow records was perhaps the controlling reason. However, from the former decision a rather definite idea can be obtained of the conditions then prevailing with respect to the state line flows.

In his preliminary statement disclosing the general character of the controversy Justice Brewer quoted abstracts of the pleadings and statements of the respective counsel, among which appeared the following statement by Kansas counsel (206 U. S. 52):

> "* * * by the year 1891 all the natural and normal waters and a large portion of the flood waters of the Arkansas river were so appropriated (by Colorado) and diverted and actually applied to these dry, barren, arid, nonriparian and nonsaturated lands in the State of Colorado, said diversions increasing from year to year, as their means of diversion became more complete and perfect *so the average flow of the river was greatly and permanently diminished and the normal flow of the river, exclusive of floods, was wholly and permanently destroyed* * * * and the water for the irrigation ditches in the western part of Kansas has been entirely cut off."

In its opinion, this Court said, with reference to stream flow in Kansas (206 U. S. 115):

[11] See Kansas Ex. 17 for October, 1907 to December, 1930; Colo. Ex. 192 for January, 1931 to September, 1940 and Colo. Exs. 204, 208, 209, 210, 214 and 215 (App. B, pp. 54-68) for the period 1908 to 1938 inclusive.

"That there is a great variance in the amount of water flowing down the channel at different seasons of the year and in different years is undoubted; that at times *the entire bed of the channel has been in places dry is evident from the testimony.*"

The Court said as to the irrigation ditches in western Kansas that (206 U. S. 113):

"It is true that those ditches have ceased to be of much value, *the flow in them having largely diminished.*"

Thus in the former case Kansas contended that the "normal" flow of the river had been wholly and permanently "destroyed" and the Court found that there was a great variance in flow, that at times the entire bed of the channel was "dry" and that the flow in the Kansas ditches had "largely diminished."

In the case at bar Kansas seeks to create the impression that at the time of the former case there was a substantial flow at the state line. Such contention is necessary to substantiate the claim of a material increase in stream depletion by Colorado. Thus in the former case Kansas fought Colorado on the basis that Colorado had utterly "destroyed" the flow into Kansas. In this case Kansas says that there was a substantial flow at that time which has since been depleted by Colorado. It is a fair comment that the knowledge of the true facts was probably more accurate in the contemporary period than it is forty years later.

A witness for Kansas in this case computed the state line flow for the period 1895 to 1907 by making estimates from stream gaging stations, some of which were over 200 miles away. (App. A, pp. 74-75). His results appear in a tabulation in Kans. Ex. 70 (Tr. p. 1569), which also gives the measured flows for the period 1907 to 1930. The following table is from that exhibit:

Year	Acre Feet (Estimated)	Year	Acre Feet (Recorded)	Year	Acre Feet (Recorded)
1895	580,000	1908	570,000	1918	60,000
1896	150,000	1909	250,000	1919	230,000
1897	460,000	1910	170,000	1920	200,000
1898	270,000	1911	110,000	1921*	960,000*
1899	340,000	1912	220,000	1922	100,000
1900	980,000	1913	120,000	1923**	820,000**
1901	180,000	1914	560,000	1924	300,000
1902	280,000	1915	500,000	1925	260,000
1903	410,000	1916	140,000	1926	110,000
1904	500,000	1917	60,000	1927	460,000
1905	950,000	.....	.....	1928	270,000
1906	260,000	.....	.....	1929	260,000
1907	240,000	.....	.....	1930	220,000

*Pueblo Flood.
**Wettest Year in 42 Years.

The period 1895 to 1930 selected by the Kansas witness began just after the drouth of 1888 to 1894 (Tr. p. 3424, 3485, Colo. Ex. 17, 18), and ends just before the recent drouth of 1931 to 1940. Since major floods during the period are included in the annual totals and since by the period selected the drouths of major intensity and duration that immediately preceded and followed it are excluded, Colorado contends that the period averages are thereby distorted, constitute greater than normal values and do not properly represent the true conditions.[12]

The average for the 6-year period 1895 to 1900 inclusive of the estimated flows appearing in Kans. Ex. 70 is 413,000 acre-feet annually. Yet in 1901 Kansas presented to this Court its complaint against Colorado and there alleged that the normal flow of the river was "wholly and permanently destroyed." We submit that the only reasonable conclusion to be drawn is that the estimated values are entirely too high.

[12]While 1923 was admittedly the "wettest year in 42 years"—meaning that total precipitation over the drainage basin in Colorado was the greatest recorded since Weather Bureau stations were established—nevertheless the Kansas witness estimates that state line flows were greater by 160,000 acre-feet in 1900, by 130,000 in 1905, than were recorded in 1923. Also while the Pueblo flood in 1921 was by far the greatest ever observed or recorded in the Arkansas Valley in Colorado the Kansas witness estimates that equal or greater state line flows occurred in both 1900 and 1905.

The important question here is not whether the floods prior to 1908 were of greater frequency or magnitude than the floods of subsequent years, nor whether there were depletions of the stream flows caused by diversions and uses of water in Colorado prior to the institution of the former suit. Instead the question is whether or not the state line flows divertible and usable for irrigation in Kansas have been changed in character or diminished in amount because of materially increased depletions in Colorado since the 1907 decision in *Kansas v. Colorado*. On this question Kansas has presented no evidence to show that the state line flows divertible and usable in Kansas have diminished in amount. However, Colorado did present evidence showing the recorded state line flows during the period 1908 to 1938, the portions thereof that were divertible by ditches of an aggregate capacity of 2,000 cfs. and the portions of divertible flows that were usable and unusable by irrigation enterprises in Kansas. As summarized by Colo. Exs. 209, 211, 214, 215 (App. B, pp. 61-68), (Tr. pp. 6640-6675), the state line flows for the period 1908 to 1938 were as follows:

Flow of Arkansas River Across the State Line From Colorado into Kansas Period 1908 to 1938

(Values in Acre-Feet)

Year	(Colo. Ex. 209) Totals	Divertible Stateline Flows (Colo. Ex. 211) Annual	Winter (a)	Summer (b)	Summer Flows (Colo. Ex. 214, 215) Unusable	Usable
1908	560,800	154,700	109,800	44,900	5,600	39,300
09	251,400	204,000	62,100	141,900	51,100	90,800
1910	119,400	107,400	41,900	65,500	6,500	59,000
11	107,200	102,000	59,400	42,600	0	42,600
12	222,700	184,400	88,700	95,700	19,800	75,900
13	115,300	105,000	82,100	22,900	0	22,900
14	576,500	315,900	48,700	267,200	174,900	92,300
1915	495,700	345,200	66,000	279,200	168,100	111,100
16	144,300	119,500	74,400	45,100	5,500	39,600
17	59,400	59,400	40,400	19,000	0	19,000
18	58,900	58,900	32,600	26,300	0	26,300
19	225,900	207,400	76,400	131,000	61,400	69,600
1920	199,200	190,800	81,100	109,700	31,900	77,800
21	961,400	368,900	60,400	308,500	238,600	69,900
22	93,700	93,700	57,600	36,100	0	36,100
23	800,800	502,100	188,000	314,100	218,900	95,200
24	292,600	292,600	189,100	103,500	47,500	56,000
1925	254,000	183,000	63,500	119,500	40,000	79,500
26	102,900	102,800	48,000	54,800	4,600	50,200
27	452,900	209,900	49,700	160,200	68,800	91,400
28	264,200	196,600	62,700	133,900	74,300	59,600
29	250,800	175,500	91,000	84,500	16,500	68,000
1930	205,500	193,200	126,200	67,000	5,400	61,600
31	107,200	107,200	69,300	37,900	0	37,900
32	58,300	58,300	28,200	30,100	0	30,100
33	173,000	147,200	26,300	120,900	27,100	93,800
34	54,100	50,300	21,200	29,100	0	29,100
1935	193,200	146,200	17,700	128,500	22,300	106,200
36	345,000	170,100	32,000	138,100	35,900	102,200
37	132,300	90,600	23,400	67,200	7,600	59,600
38	204,500	171,200	29,900	141,300	18,200	123,100
AVGE.	260,700	174,700	66,100	108,600	43,600	65,000

(a) October to March inclusive.
(b) April to September inclusive.

The recorded total state line flows (Colo. Ex. 209, App. B, p. 61) for the years 1908 to 1930 as shown in the above table are substantially the same values as appear in Kans. Ex. 70 which his been previously discussed. The average for the period of 1908 to 1930 of 317,000 acre-feet annually is reduced to an average of 260,700 acre-feet annually for the period 1908 to 1938 because of the inclusion

of the eight drouth years of 1931 to 1938. This factor is important because it indicates that the averages compiled by the Kansas witness, being based on periods of above-normal natural precipitation, are excessive in amount.

On the question of whether since the 1907 decision there has been a material increase in stream depletion in Colorado which has manifested itself in a diminution of state line flows divertible and usable for irrigation in Kansas, a comparison of the conditions existing immediately thereafter with the conditions of a recent period shows:

Average Stateline Flows
(Values in Acre-Feet)

Periods of Years	Total Annual Flows	Divertible Summer Flows	Usable Summer Flows
1908-1913 (a)	229,500	68,900	55,100
1933-1938 (b)	183,700	104,200	85,709

(a) First 6-years after decision in 1907 in *Kansas v. Colorado.*
(b) Last 6-years of 1908-1938, during recent drouth of 1931-1940.

Comparing the data for 1908-to 1913 with that for 1933 to 1938 it appears that, while there was a decline in the average annual total state line flows, such a decline could not have adversely affected or injured the Kansas irrigation interests for the reason that there were substantial increases in the quantities divertible and usable by Kansas ditches during the summer months. These increases were recorded in spite of the drouth conditions prevailing during the years 1933 to 1938 and are attributable to the stream flow regulation afforded by irrigation in Colorado under which summer floods and winter flows are conserved for use in time of need, and to the increasing return flows in Colorado. Kansas may not predicate its complaint against Colorado on alleged depletion of stream flows which Kansas did not use and could not have used and which if they were not used in Colorado would flow out of the irrigated region without being placed to use. The above tables show clearly that the waters which could have been diverted and used by Kansas ditches have not decreased since the 1907 decision but to the contrary have progressively increased since then.

Again we point out that Kansas has offered no evidence concerning the divertible and usable state line flows.

(iii) Since the Decision in Kansas v. Colorado the Quantities of Water Diverted and Used by the Kansas Irrigation Ditches have Materially Increased.

It will be remembered that this Court in its 1907 decision stated (206 U. S. 113) that the irrigation ditches in western Kansas "have ceased to be of much value, the flow in them having largely diminished." As repeatedly pointed out herein, the complaint of Kansas and the Report of the Master are both predicated upon the proposition that Kansas has been deprived of water for irrigation purposes. Kansas has introduced no evidence as to the diversions by, or conditions of, its irrigation ditches at the time of, and prior to, the filing of the former case. While Colorado insists upon the validity of its position that the 1907 decision is binding upon the claims of the states as they then existed, it has, for the information of the Court, introduced considerable evidence as to the conditions of the Kansas ditches from 1880 to the present (Tr. pp. 3462-3513), and has shown that in the period 1894-1901 all the Garden City group of ditches were bankrupt, that receivership operation was unsuccessful, that the irrigated acreage declined to insignificant amounts, and that the farmers refused to contract or pay for water (Tr. pp. 3462-3513, App. A, pp. 108-112).

With respect to diversions made by the Kansas ditches since 1907 Colorado presented tables (Colo. Ex. 213, App. B. p. 65, Tr. p. 6656) showing the quantities of water diverted from the surface flows of the Arkansas river each year and each summer season for the period 1908 to 1938 inclusive by all ditches in Hamilton, Kearney and Finney counties in Kansas.[13] Such uses of water as are made for

[13]Because of the failure of Kansas to keep records these flows are necessarily calculated for the period prior to 1915. For the period 1916-1938 the values are from various records as noted on Colo. Ex. 213. In view of the statement of this Court in its 1907 decision relative to the Kansas ditches (206 U. S. 113) the values for the early period would seem to be most generous.

irrigation purposes in all other counties of Kansas, including all portions of the Arkansas river basin in that state east of Finney county, may be ignored herein for the reason that such other uses are not dependent on water supplies received from Colorado (Tr. p. 3544). The following table summarizes the information contained in Colo. Ex. 213 relative to the Kansas ditch diversions.

Diversions from Arkansas River by Ditches
In Hamilton, Kearney and Finney Counties, Kansas
(Values in Acre-Feet; From Colo. Ex. 213)

Year	Annual	Six-Year Averages	Summer Apr.-Sept.	Six-Year Averages
1908	45,000		30,000	
09	93,000		80,000	
1910	57,000		45,000	
11	56,000		40,000	
12	75,000		65,000	
13	29,000	59,200	20,000	46,700
14	96,000	67,700	85,000	55,800
1915	105,000	69,700	90,000	57,500
16	82,200	73,900	41,400	56,900
17	54,300	73,600	17,100	53,100
18	69,300	72,600	26,900	46,700
19	99,000	84,300	58,500	53,200
1920	111,700	86,900	73,700	51,300
21	71,000	81,200	41,600	43,200
22	56,400	77,000	35,200	42,200
1923	116,600	87,300	93,200	54,800
16-Yr. Avge.	76,000		52,700	
1924	55,700	85,100	46,500	58,100
1925	117,500	88,200	65,000	59,200
26	78,700	82,600	47,300	54,800
27	127,800	92,100	89,400	62,800
28	85,500	97,000	40,500	63,600
29	123,400	98,100	62,000	58,400
1930	116,600	108,200	60,200	60,700
31	61,900	99,000	28,500	54,600
32	54,200	94,900	33,700	52,400
33	110,600	92,000	84,200	51,500
34	46,800	85,600	23,400	48,700
1935	102,100	82,000	85,200	52,500
36	120,200	82,600	84,000	56,500
37	69,900	84,000	55,600	61,000
1938	145,200	99,100	122,700	75,800
15-Yr. Avge.	94,400		61,800	
31-Yr. Avge.	84,900		57,100	

Comparing the first six years of this period with the last six years, we find the following:

	Annual Diversions	Summer Diversions (Apr.-Sept.)
1908-1913 inc.	59,200	46,700
1933-1938 inc.	99,100	75,800

Progressive improvement in stream flow conditions at the state line and in western Kansas during recent decades may be demonstrated by the historical relations between the quantities of water diverted from the Arkansas river by ditches in Kansas and the original water supplies of the interstate stream as indicated at selected index stations. Using the index stations selected by Kansas and the combined flows at said stations shown in Kansas Exhibit 134 (App. B, p. 73), the historical relations, by six-year period averages, are given in the following tables:

Relations Between Index Flows and Kansas Diversions
(Compiled from Kans. Ex. 134 and Colo. Ex. 213)

Six Year Periods	Average Annual Index Flows (Acre-Feet)	(% Avg.)	Average Annual Diversions of Ditches in Kansas (Acre-Feet)	(% Avg.)	(% Index)
1908-13	667,510	99.6	59,200	69.7	8.9
1909-14	741,310	110.7	67,700	79.7	9.1
1910-15	719,100	107.3	69,700	82.1	9.7
1911-16	736,160	109.8	73,900	87.0	10.0
1912-17	734,170	109.5	73,600	86.7	10.0
1913-18	726,750	108.4	72,600	85.5	10.0
1914-19	764,270	114.0	84,300	99.3	11.0
1915-20	736,530	109.9	86,900	102.4	11.8
1916-21	750,220	111.9	81,200	95.6	10.8
1917-22	723,360	107.9	77,000	90.7	10.6
1918-23	783,350	116.9	87,300	102.8	11.1
1919-24	784,820	117.1	85,100	100.2	10.9
1920-25	747,270	111.5	88,200	103.9	11.8
1921-26	726,050	108.3	82,600	97.3	11.4
1922-27	726,560	108.4	92,100	108.5	12.7
1923-28	743,000	110.8	97,000	114.3	13.1
1924-29	687,630	102.6	98,100	115.5	14.3
1925-30	673,460	100.5	108,200	127.4	16.1
1926-31	654,070	97.6	99,000	116.6	15.1
1927-32	638,810	95.3	94,900	111.9	14.9
1928-33	590,550	88.1	92,000	108.5	15.6
1929-34	533,120	79.5	85,600	100.9	16.1
1930-35	503,830	75.2	82,000	96.7	16.3
1931-36	512,760	76.5	82,600	97.4	16.2
1932-37	527,350	78.7	84,000	99.0	16.0
1933-38	540,350	80.6	99,100	116.8	18.3
1908-38	670,380	100.	84,900	100.	12.6

During the 1908-1913 period the Kansas ditches diverted an average of 59,200 acre-feet per year, the equivalent of 8.9 percent of the combined index flows of the period. In the 1925-1930 period the Kansas diversions had increased to an average of 108,200 acre-feet per year, the equivalent of 16.1 percent of the index flows. The recent drouth cycle caused the index flows to decrease materially, but the Kansas ditch diversions maintained at average rates i. e., averaging 99,100 acre-feet per year during 1933 to 1938, the equivalent of 18.3 percent of the index flows at that period. *The progressive increase, from 8.9 percent during 1908 to 1913, to 18.3 percent during 1933 to 1938 in the relations between Kansas diversions and stream flows at index stations, evidences a material improvement in stream flow conditions at the state line and in western Kansas during the historical period since the conclusion in 1907 of the original interstate litigation.*

(c) There Has Been no Injury to the Substantial Interests of Kansas.

The second condition imposed by this Court in its 1907 decision upon the right of Kansas to reopen the interstate litigation was that there must be injury to the substantial interests of Kansas. This is in conformity with the rule oft expressed that this Court will not exert its extraordinary power to control the conduct of one state at the suit of another unless the threatened invasion of rights is of serious magnitude (*Connecticut v. Massachusetts*, 282 U. S. 660, 669, 51 S. Ct. 286). The position of Colorado is that Kansas has shown no such injury. The most that can be said of the Kansas evidence is that it tends to show that there is irrigable land in Kansas which could be irrigated if water was available. *There is no showing that any Kansas enterprise, irrigation, industrial, municipal or otherwise, is in any worse condition now than at the time of the former case as a result of anything whatsoever which Colorado has done with reference to the waters of the Arkansas basin. These undisputed facts are completely ignored by the Master.*

In considering the question of possible injury to Kansas this Court in its former decision gave weight to statistics of population and crop production. Evidence offered by Colorado covers these same subjects and shows conclusively that there has been no injury to the substantial interests of Kansas.

(i) Population.

One factor which evidences the condition of a region is the growth and stability of population. In its decision in *Kansas v. Colorado* this Court gave the statistics for Colorado and Kansas counties crossed by the river (206 U. S. 108, 110). The following table taken from United States census bureau reports gives the figures on population in these same counties for each decade from 1880 to 1940 inclusive:

Population of Counties Along Arkansas River
In Eastern Colorado and in Kansas

(As Reported by U. S. Census Bureau)

	1880*	1890*	1900*	1910	1920	1930	1940
Fremont	4,735	9,156	15,636	18,181	17,883	18,896	19,742
Pueblo	7,617	31,491	34,448	52,223	57,683	66,038	68,870
Otero (1889)	.....	4,192	11,522	20,201	22,623	24,390	23,571
Crowley (1911)	.....	.....	.....	.....	6,383	5,934	5,398
Bent	1,654	1,313	3,049	5,043	9,705	9,134	9,653
Prowers (1889)	.....	1,969	3,766	9,520	13,845	14,762	12,304
Colo. Group	14,006	48,121	68,421	105,168	128,122	139,154	139,538
Hamilton	168	2,027	1,426	3,360	2,586	3,328	2,645
Kearney	159	1,571	1,107	3,206	2,617	3,196	2,525
Finney (1884)	.....	3,350	3,469	6,908	7,674	11,014	10,092
Gray (1887)	.....	2,415	1,264	3,121	4,711	6,211	4,773
Ford	3,122	5,308	5,497	11,393	14,273	20,647	17,254
Western Kans.	3,449	14,671	12,763	27,988	31,861	44,396	37,289
Edwards	2,409	3,600	3,682	7,033	7,057	7,295	6,377
Pawnee	5,396	5,204	5,084	8,859	9,323	10,510	10,300
Barton	10,318	13,172	13,784	17,876	18,422	19,776	25,010
Rice	9,292	11,451	11,745	15,106	14,832	13,800	17,213
Reno	12,826	27,079	29,027	37,853	44,423	47,785	52,165
Sedgwick	18,753	43,626	44,037	73,095	92,234	136,330	143,311
Sumner	20,812	30,271	25,631	30,654	29,213	28,960	26,163
Cowley	21,538	34,478	30,156	31,790	35,155	40,903	38,139
Central Kans.	101,344	171,881	166,146	222,266	250,659	305,359	328,678
Kansas Group	104,793	186,552	178,909	250,254	282,520	349,755	355,967

*Figures for years cited by Court in opinion (*Kansas v. Colorado*—1907).

From the foregoing table it appears that, from 1900 to 1940, the population of the counties along the Arkansas river, considered by groups, substantially doubled in Colorado, trebled in western Kansas and doubled in eastern Kansas. From such official records the conclusions seem justified, that no one county or group of counties has unduly grown in size, that none has prospered at the expense of others, and while the Colorado counties have increased their population during the past forty years, similar or greater increases have been recorded in the Kansas counties (App. A, pp. 99-103).

(ii) Agricultural Production.

An indication of prosperity and welfare of the Kansas section of the basin is the acreage and value of field crops. The following table, compiled from Colo. Ex. 55 (App. B, p. 9, Tr. p. 2932) shows the acres of field crops in counties on the channel of the Arkansas river in central and western Kansas.[14]

Acres of Field Crops in Central and Western Kansas

(From K.S.B.A. Reports: Colo. Exs. 55 and 57)

Years	Eight Counties of Central Kansas on Channel of Ark. R.	Five Counties in WesternKansas on River Channel
1881	1,132,209	3,840
1885	1,210,724	15,394
1888	1,201,035	87,215
1890	996,718	90,027
1895	2,402,951	189,349
1900	2,293,617	159,036
1905	2,501,216	274,123
1910	2,602,906	579,012
1915	2,382,817	570,172
1920	2,845,961	797,995
1925	2,894,807	886,048
1930	2,954,708	1,186,581

The values of field crops in Kansas counties along the river are also significant. The table which follows was compiled from Colo. Ex. 66 (App. B., p. 13) and shows the value of field crops as reported by the Kansas State Board of Agriculture.

[14]The figures are taken from the Kansas State Board of Agriculture Reports.

Value of Field Crops in Central and Western Kansas

(From Colo. Exs. 66 and 67)

Years	Eight Counties of Central Kansas on Channel of Ark. R.	Five Counties of Western Kansas on Channel of Ark. R.
1881	$14,231,430	$ 44,514
1885	10,211,050	205,043
1888	10,473,370	778,180
1890	8,869,650	997,475
1895	8,293,421	720,576
1900	16,850,680	1,257,877
1905	22,568,877	2,319,927
1910	25,463,350	5,752,229
1915	29,747,770	7,654,201
1920	62,247,650	15,985,830
1925	38,603,900	10,338,250
1930	26,542,899	10,050,200

The above tables show no injury to the substantial Kansas interests. Rather, they show that since the former decision of this Court there has been a marked increase in the agricultural production of the Kansas counties crossed by the Arkansas river.

(iii) Irrigated Acreage.

The basis of the Kansas cross-bill is that it and its water users have been deprived of water for irrigation purposes. Consequently, it is important to see what the records show as to irrigated acreage. The following table gives the irrigated acreages in the Arkansas river basin in Colorado and Kansas as reported by the United States Census Bureau:

Irrigated Acreages in Arkansas River Basin in Colorado and Kansas

(As Reported by United States Census Bureau)

Year	Basin in Colorado	Data for State of Kansas: Entire State	Ark. R. Basin (a)	Five Counties (b)	Three Counties (c)
1889	144,858	20,818	17,821	17,552	15,499
1899	281,592	23,620	19,483	18,570	17,924
1902	300,115	28,922			
1909	464,236	37,479	35,357	34,879	34,819
1919	(611,476) (d)	47,312	46,539	41,485	(40,660) (e)
	516,213				52,949
1929	557,933	71,290	68,781	60,897	60,072 (f)
1939	469,168	99,980	94,064	64,104	56,341

(a) Data for Arkansas river basin in Kansas excludes areas in Cimarron River valley, but includes areas in tributaries entering below Garden City, as Pawnee Creek, and includes areas irrigated from ground waters, as Scott County and elsewhere.

(b) Five Counties are Hamilton, Kearney, Finney, Gray and Ford.

(c) Three Counties are Hamilton, Kearney and Finney.

(d) Per Colo. Ex. 206: "Believed too large by reason of inclusion of lands under Carey Act and other projects for which irrigation works were not completed."—Figure below from Kans. Ex. 51, i.e., District Water Commissioner Reports.

(e) Kansas witness Knapp (Tr. p. 2355) contends figure is too low—suggests substitution of figure below, from Kans. Ex. 115.

(f) 46,837 acres irrigated with river water, 13,235 acres served by wells and pumps.

With respect to the acreages irrigated in the Arkansas river basin in Colorado and in the counties of Hamilton, Kearney and Finney in Kansas, development has progressed proportionately in both states, and the relations prevailing forty years ago have not been disturbed. This is indicated by the following summary from the foregoing table:

Interstate Relations per Irrigated Acreages

Census Years	Basin Totals	Colorado Portion Acres	Colorado Portion Percents	Kansas Portion Acres	Kansas Portion Percents
1889	160,357	144,858	90.3	15,499	9.7
1899	299,516	281,592	94.0	17,924	6.0
1902	324,650	300,115	92.4	24,535*	7.6*
1909	499,055	464,236	93.0	34,819	7.0
1919**	569,162	516,213	90.7	52,949	9.3
1929	618,005	557,933	90.3	60,072	9.7
1939	525,569	469,168	89.3	56,341	10.7

*Figure for 1902 covers entire basin in Kansas, and includes areas in Cimarron river valley and areas along main river and tributaries in Kansas east of Finney County.

**Figures for 1919 from sources other than United States Census Bureau.

The State of Kansas had 6.0 percent in 1899 and 7.0 percent in 1909 of the total irrigated acreage in the upper Arkansas river basin. Its share of the total has since increased to 9.7 percent in 1929, and to 10.7 percent in 1939. Manifestly, Colorado's expansion of irrigated acreage, whatever may have been its basis, has not prevented Kansas from making the same or greater proportionate expansion of irrigated acreage in that state (App. A, pp. 89-92).

Indeed the whole question of injury to the substantial interests of Kansas may be simply answered by the fact that in this case Kansas has introduced no evidence to show that since the former decision there has been any decline in population, agricultural production or irrigated acreage in the Kansas counties along the Arkansas river, resulting from any acts of Colorado or its water users.

(iv) The Great Body of the Valley in Kansas has Not Been Injured.

In its 1907 decision this Court in summarizing its conclusions referred to the fact that the Colorado irrigation uses have diminished the flow of the water into the State of Kansas and said among other things (206 U. S. 117):

> "* * while the influence of such diminution has been of perceptible injury to portions of the Arkansas valley in Kansas, particularly those portions closest to the Colorado line, yet, to the great body of the valley it has worked little, if any, detriment, and regarding the interests of both states, and the right of each to receive benefit through irrigation and in any other manner from the waters of this stream, we are not satisfied that Kansas has made out a case entitling it to a decree."

Thus it is apparent that in determining the previous suit the Court did not confine its consideration to the few

counties in western Kansas where irrigation is practiced from the surface flows of the Arkansas river in Kansas. Colorado is fully in accord with this treatment of the problem. During the introduction of testimony Kansas has repeatedly and consistently objected to all evidence pertaining to any portions of the basin in Kansas except the few western counties in which irrigation is practiced from the surface flows of the river.

For this discussion it is convenient to divide the drainage basin of the Arkansas river in Kansas at Garden City and to consider the two sections separately. The upper section involves a river length of about 75 miles and a drainage area of 5,265 square miles (Colo. Ex. 205), while the lower section from Garden City to the Oklahoma state line involves a river length of 315 miles and a drainage area of 16,930 square miles (Tr. p. 5755).[15]

The division of the Arkansas river basin in Kansas at Garden City is proper for the reason that all diversions of the surface waters of the main river in Kansas for irrigation purposes are located upstream from Garden City and none are made or attempted below that point. There is no dependence by the portion of the basin below Garden City on water supplies received from Colorado. In that section the water supplies produced by local rainfall not only satisfy all present requirements of water but they produce a surplus outflow that crosses the state line from Kansas into Oklahoma (Tr. p. 5759, App. A, pp. 56, 57).

This unconsumed surplus outflow averaged about 1,700,000 acre-feet per year as recorded during 1922-1931 (Tr. p. 5759) and as indicated in the following table:

[15]This drainage area given for the lower river is exclusive of lands along the southern border of Kansas drained by the Cimarron river, a tributary entering the Arkansas river in Oklahoma, and is exclusive of lands in eastern Kansas drained by the Verdigris and Neosho-Grand rivers, which are also tributary to the Arkansas river in Oklahoma and which deliver across the Oklahoma state line an average of about 4,000,000 acre-feet of water annually in addition to the quantities delivered by the Arkansas river itself.

Flow of Arkansas River	Annual Values in Acre-Feet Recorded Period Averages
At Kans.-Okla. State Line	1,703,414 (a)
At Garden City, Kansas	191,182 (b)
Net Increase (c)	1,512,232

(a) Period 1922-1931 (Tr. p. 5759).
(b) Period 1923-1932 (Tr. p. 5779).
(c) Represents unconsumed surplus of water supply and river flow produced by natural precipitation on the lower Arkansas River basin in Kansas.

The total water supplies of the lower Arkansas river basin in Kansas, produced by natural precipitation on the drainage area between Garden City and the Oklahoma state line, necessarily exceed the total flow of the river, as above outlined, by the quantities of water consumed incident to the production of agricultural crops upon the lands of the tributary drainage area, and by the quantities consumed through the utilization of surface waters for irrigation (as in Pawnee Creek valley), and of ground waters for irrigation and other purposes (Tr. p. 5761). Factual data concerning the growth and development of the counties in central Kansas located along the Arkansas river, and of adjoining counties located wholly or in part in the drainage basin of the Arkansas river, with statistics by years for the period from 1884 to 1930, concerning populations, acreages and values of field crops harvested, assessed valuations, and related information, appear in Colo. Exs. 43 to 71 inclusive (App. A, pp. 92-99, App. B, pp. 3-18).

As described on cross examination (Tr. pp. 5320-5323) by the Irrigation Commissioner of Kansas, the water supplies of the lower Arkansas Valley in Kansas are produced by local precipitation, some of which percolates through the sandy top-soils and enters a water bearing stratum of coarse sands and gravels. This underground formation acts as a large natural storage reservoir; and the river, which necessarily flows in the lowest part of the valley, acts as a drain to carry off the surplus ground waters.

It will be recalled, in the former *Kansas v. Colorado* case, Kansas alleged that the bottom lands of the great body of the Arkansas Valley in Kansas were dependent for their successful and prosperous cultivation on the waters flowing in the Arkansas river, for saturating and sub-irrigating the bottom lands back to the uplands on either side of the river; that prior to extensive irrigation in Colorado the crops on said bottom lands in Kansas were not only bounteous but practically certain; and that, as a result of depletions in Colorado, the surface of the water beneath the bottom lands was lowered about five feet, and the productiveness and value of the bottom lands were greatly diminished (206 U. S. 51-52).

In the case at bar Kansas admits that, contrary to its allegations in the former *Kansas v. Colorado* case, the bottom land agriculture in the Arkansas Valley in Kansas is dependent, not on river flows, but on ground waters produced by local precipitation, and that the river flows consist of surplus and unused water supplies. Manifestly, under such circumstances, nothing that was done prior to or since the decision in *Kansas v. Colorado*, with respect to depletions of the river flows in upstream areas, could have detrimentally affected or injured the substantial interests of the great body of the lower Arkansas Valley in Kansas.

The showing made by Colorado in regard to the basin of the Arkansas river below Garden City has not been disputed by Kansas.

(d) Since Kansas has not Been Injured, No Affirmative Decree Should Be Entered Against Colorado under the Cross-Bill.

It is well to consider for a moment the nature of an interstate suit such as this. If the entire Arkansas basin were in one state, a suit such as this would never arise even though in such a situation the irrigation development would, in all probability, have taken the same course as it has here. This results from the fact that the first use of

water at a point near the source is essential to the greatest conservation and beneficial use of stream flow (Tr. p. 3391). With the development of return flows, uses become possible farther and farther downstream.

Except for those powers delegated to the federal government, the jurisdiction of each state within its own territory is necessarily exclusive and absolute. It is susceptible of no limitation not imposed by itself. Any restriction upon it deriving validity from an external source would imply a diminution of its quasi-sovereignty to the extent of the restriction, and an increase of quasi-sovereignty to the same extent in that state which could impose such restriction. The rule has been stated that all exceptions to the full and complete power of a nation within its own territory must be traced up to the consent of the nation itself (*Schooner Exchange v. McFadden*, 7 Cranch. 116, 136, 3 L. Ed. 287, 293). Recognizing, of course, the supremacy of the federal government as to the powers delegated to it, the same rule applies to the states of the Union.

If Kansas and Colorado were independent sovereignties, Colorado would not be obligated by any principle of international law to permit any part of the flow to pass to Kansas (21 Opinions Attorney General 274). But the states are only quasi-sovereignties, members of our federal Union, and, by the decisions of this Court, each is entitled only to its equitable share of the benefits of the flow of the stream. Since the states may not make war, the equitable apportionment of these benefits may be accomplished only by a compact made with the approval of Congress or by a decision of the United States Supreme Court. While a state may by compact approved by Congress voluntarily submit to restrictions or limitations on use of water, yet those same restrictions or limitations may not be forcibly imposed by a decree of this Court in the absence of a clear showing of serious and substantial injury. Otherwise, the equality of the states would be destroyed.

Any apportionment between states of the waters of an interstate stream which may be made (and we deny that one should be made in this case) must necessarily impose some restriction or limitation on the upper state in order to be effective. This results from the elementary fact that water flows down hill. The imposition of a condition on a lower state is ineffective to produce any apportionment of stream flow. Whatever limitations or restrictions are placed upon an upper state amount actually to the impairment of the quasi-sovereignty of the upper state. When an apportionment is made by action of this Court, the limitations and restrictions on the upper state are imposed, not voluntarily, but by a greater power, the Court. Because such limitations and restrictions constitute an actual infringement on the quasi-sovereign powers of the state, the Court has always been most reluctant to control the acts and powers of a state and has repeatedly held that it woud not do so unless an injury of serious magnitude is established by clear and convincing evidence (*Connecticut v. Massachusetts*, 282 U. S. 660, 669, 51 S. Ct. 286). Hence the question of whether or not Kansas is entitled to relief against Colorado under its cross-bill resolves itself to a determination of whether or not Kansas has suffered an injury of serious magnitude shown by clear and convincing evidence to have resulted from some act of Colorado. No such injury has been shown.

(e) The Finding of the Special Master As to Stream Depletion and Injury is Contrary to the Evidence and the Law and Should not be accepted or followed By the Court.

In his Report the Special Master refers to the question of stream depletion and injury to Kansas only in his Finding of Fact "Five" (Report p. 9) which reads thus:

> "*Depletion by Colorado of the Water Supply of the Arkansas River Since the Taking of Testimony in The Case of Kansas against Colorado decided in 1907.* There has been since the taking of testimony in

the case of Kansas against Colorado cited in 206 U. S. 46, in 1907, a material increase in the river depletion by Colorado of the water supply of the Arkansas river, which has been consumed and used by Colorado users for irrigation purposes and which has diminished the flow of the water into the State of Kansas and that by reason thereof there have been injuries to the substantial interests in Kansas"

At no other place in the Report is the subject mentioned. No specific findings whatsoever are made. *Nothing is found as to the amount of increase in stream depletion by Colorado and the Report is absolutely silent as to the nature of the injuries to Kansas.* Surely, in a case such as this, which, in our federal Union, is the substitute for war, mere general findings, which as we have shown are utterly at variance with the evidence, cannot suffice to justify or require the impairment of the quasi-sovereign rights and powers of Colorado. We say that a disposition of the important contentions of Colorado that it has not made a material increase in the depletion of the stream and that Kansas has not been injured should not be lightly tossed aside by a sweeping general finding. Such procedure is not in conformity with the spirit of the decisions of this Court in interstate controversies.

It has been well said, *Oklahoma v. Texas,* 265 U. S. 560, 44 S. Ct. 573, that its jurisdiction to hear and determine all interstate controversies is perhaps the most impressive prerogative of the United States Supreme Court and has as its result the effect of eliminating the necessity of diplomacy and perchance a resort to the final arbitrament of war. We say that such prerogative is not properly exercised when a general finding such as that made by the Master is used as the basis for the impairment of the quasi-sovereignty of a state. Colorado is entitled to know wherein it has offended before its rights and powers are impaired.

In *Virginia v. West Virginia,* 220 U. S. 1, 36, 31 S. Ct. 330, 336 this Court said that great states have a temper superior to that of private litigants. It is with full recog-

nition of this superior responsibility that Colorado has asserted and is now asserting that neither the state nor its water users has, since the decision in the former case, materially increased the depletion of the water supply of the Arkansas river to the injury of the substantial interests of Kansas. This contention by Colorado is supported by immutable facts. By his general finding of depletion and injury, a finding which we say is utterly without foundation in the record, the Special Master erred most grievously to the great injury of Colorado.

3.

THE REPORT OF THE SPECIAL MASTER IS SO AMBIGUOUS, INCONSISTENT AND CONFUSING THAT IT IS IMPOSSIBLE TO DETERMINE HOW MUCH WATER IS APPORTIONED TO EACH STATE AND HOW THE STREAM IS TO BE ADMINISTERED TO EFFECTUATE SUCH AN APPORTIONMENT.

(a) The Master Misconceives the Problems Inherent in an Apportionment between States of a Fluctuating Water Supply Such as that of the Arkansas River.

All parties have filed exceptions to the Report and Recommendation of the Special Master. A reading of the Report and the exceptions should suffice to establish conclusively the unworkability of the apportionment recommended by the Master.

It is apparent that the Master has brushed aside the Colorado contention that Kansas has failed to sustain the burden of establishing an injury to its substantial interests as a result of increased stream depletion by Colorado, and has dealt with the situation as if the only question involved was the division of a certain amount of water available at all times and easily susceptible of measurement. Nature has not created such a condition in that portion of the Arkansas river lying in Colorado and western Kansas. The water supply has extreme variations. Colorado Exhibit 209, (Tr. p. 6640, App. B., p. 61), shows that in the period 1908-1938 the annual state line flow varied from a minimum of 54,100 acre-feet to a maximum of 961,400 acre-feet (App. A., p. 118).

The concept of the Master seems to be that the water supply of the Arkansas river and its tributaries on the basis of "average annual dependable and fairly continuous amounts" is 1,110,000 acre-feet; that two index stations, i.e., at Canon City and at the mouth of the Purgatoire, will measure accurately the water supply of the Arkansas river and the flow of the river and its tributaries (Recommended Decree, Par. 4, p. 21); and that Colorado is entitled to 925,000 and Kansas 185,000 of the total "average annual dependable supply."[16]

The Master has apparently misconceived or has not thoroughly understood the character of the stream flow in the Arkansas river. His Findings and Decree seem to be based upon the conception that there is "an average, annual, dependable and fairly continuous" amount of water available for distribution between the two states. The fact is, as is clearly demonstrated by the record, that there is no such thing as a "dependable" water supply in the Arkansas river in Colorado. It is impossible to make a division of water supplies based on averages which are the result of adding together extremely varying amounts and dividing the result by the number of years involved. This method results in a false conclusion as to what is a dependable water supply. To be dependable, the water supply must be one which can be forecast and anticipated with a reasonable degree of certainty. The water supply of the Arkansas river in Colorado is highly fluctuating. For instance the supply at Canon City varies from a minimum of 245,750 acre-feet to a maximum of 661,700 acre-feet. The flow at the mouth of the Purgatoire varies from 22,834 acre-feet in one year to 390,404 acre-feet in another. To attempt to distribute or divide the total water supply of the river upon the basis that there is a fairly continuous annual dependable supply can only lead to confusion and future controversies. Further, the repeated use by the Master of the term "natural flow" is confusing as the term is not defined. There is no true "natural flow" after irrigation development as some of the flow is then

[16] This is in the proportion of 5/6 to Colorado and 1/6 to Kansas.

return flow. Among irrigators "natural flow" is sometimes used to mean the flow under virgin conditions prior to irrigation. Others employ the term as meaning all stream flow except that resulting from storage releases or water importations from other basins. For the Report of the Master to be understandable there should be a definition of these terms.

The Canon City gaging station is located at the Royal Gorge where the river emerges from the mountains. From there to the state line, the distance is about 200 miles. Numerous tributaries, among which are Fountain river, Horse creek, and Big Sandy creek, enter from the north. On the south side of the river, there are, among other tributaries, the St. Charles river, Huerfano river, Apishapa river, and the Purgatoire river. There is irrigation along these tributaries. The Master recommends that a measuring station be maintained upon but one of these, i.e., the Purgatoire. From Canon City to the state line the Arkansas river is a losing river except during floods and the spring period of snow melt.[17] The loss of water from evaporation, transpiration and percolation exceeds the accretions to the stream flow (App. A., pp. 62-63). A witness for Colorado has estimated that the average annual natural conveyance loss from Pueblo to the state line, a distance of about 150 miles, is 126,000 acre-feet annually. (Tr. p. 3682). The characteristic, common to practically all streams of the Great Plains area, of natural conveyance losses exceeding natural accretions is a factor which the Master totally disregards. His concept seems to be that if there is a certain flow at Canon City, a percentage of that must and will arrive at the state line for delivery to Kansas. If the Arkansas river were a tightly closed conduit, carrying a supply of water which could be turned out to Colorado and Kansas in their proportionate amounts, the solution of this case would not be difficult, but such is not the situation. In the summer the hot, arid, sandy river bed absorbs moisture as does a sponge. In this con-

[17] In its former decision this Court recognized the difference between streams of the western plains, such as the Arkansas, and streams of the humid regions of the East, such as the Hudson (206 U. S. 116).

nection it should be noted Colorado introduced evidence that in a condition of nature and before the advent of irrigation the river was at times dry in the summer as far upstream as Rocky Ford or about 100 miles above the Kansas-Colorado state line (Tr. pp. 3361-3374, App. A., p. 129). Irrigation in Colorado has the effect of bringing about a more regular and sustained flow at the state line but any decree which requires Colorado to deliver a fixed percentage of the Canon City flow to the state line, in effect commands Colorado to improve upon nature.

The average flow at Canon City for the period 1908-1938 adjusted for by-passed and imported water[18] is 794 c.f.s. The range is from a maximum of 5,260 second-feet to a minimum of 90 second-feet[19] (App. A, p. 126). In its 1907 decision, this Court, with reference to Colorado priorities and the stream flow at Canon City, said (206 U. S. 106):

> "The amount of water authorized to be taken by the (Colorado) ditches from the river is, as alleged in the bill, 4,200 cubic feet, and from its affluents and tributaries 4,300 cubic feet, * * * The average flow of the river as it comes out of the Royal Gorge at Canon City is, as shown by official measurements for a series of years, 750 cubic feet. So that it appears that the irrigating ditches are authorized to take from the Arkansas River much more water than passes in the channel into the valley."

In other words, at the time of the former decision, the Colorado priorities far exceed in amount the average Canon City flow. The Master now recommends that a portion of such flow be delivered to Kansas.

The Master in his Report recognizes that the flow "is variable from year to year and season to season and day to day, and the main river at any one point may be al-

[18] By-passed water is water diverted above the gaging station and conveyed around it. Imported water is water brought to the stream from another basin which in this case is the basin of the Colorado river.

[19] These figures are obtained from Kansas Exhibit 13 (Tr. p. 1434), and Colorado Exhibit 192 (Tr. p. 6499) and do not represent adjusted flows.

most without water one day and have a flood in it the next day, and the following day have practically its original condition." (Report p. 5.) In spite of this physical situation, which the Master recognizes, he recommends in his proposed decree (Report p. 20), that the deliveries to Kansas shall be "at such times and in such amounts as and when required by water officials by the State of Kansas." The Colorado water officials are neither omnipotent nor omniscient. They cannot deliver on demand a water supply of the variability of that found in the Arkansas basin.

Under the Master's decree deliveries to Kansas must always be in balance with the proportion of the water supply allotted to Kansas. It takes several days for water to flow from Canon City to the state line. Conditions of precipitation and evaporation are such that it is an utter impossibility for Colorado water officials to maintain such balance, and yet the Master fails to recognize this physical situation.

The Master recommends that 925,000 acre-feet annually be awarded and delivered to the State of Colorado. This is a misconception of the problem. Colorado receives water as a result of natural precipitation. If there is to be a decree of apportionment herein, the only equitable basis is to adopt a plan such as that contained in the 1933 stipulation which will be discussed in detail later in this brief. No apportionment is equitable which subjects one state to the hazards resulting from the vagaries of nature and at the same time insures to another state a stable water supply.

Finally, the Master's recommendations ignore entirely the principle of beneficial use. The cardinal principle of western irrigation law is that in the arid and semi-arid regions, a water user, to retain his right, must apply the water to beneficial use. He may not by the assertion of a pure legal right deprive his neighbor of water and then permit it to go to waste. The Master specifically states that the allotment to Kansas includes water "for lands to be irrigated." He makes no finding and no recommendation as to the acreage of such lands. *There is no assur-*

ance that any additional lands in Kansas will ever be irrigated. There is no showing of any existing Kansas development which will bring additional lands under irrigation. In other words a substantial portion of water recommended for allotment to Kansas may never be placed to a beneficial use and instead would pass out of the irrigated section of the Arkansas river basin unused. Surely the Colorado farmers who are now using this water should not be made to pass it on down to Kansas to satisfy an inchoate right possibly existing in that State; yet such is the effect of the recommendation of the Master.

(b) The Findings of the Master with relation to the Water Supply are Based upon Estimates and are of No Practical Value.

By his Finding of Fact "Six" (Report p. 16), the Master states that the average annual natural flow of the river and its tributaries is 1,240,000 acre-feet, and the average annual dependable and fairly continuous water supply and flow is 1,110,000 acre-feet. These figures must have been obtained from the testimony of the Kansas witness, Ralph L. Meeker, who claims to have computed the total water production in two different ways, and because the two answers were in substantial agreement, he contends the results must be correct (Tr. p. 1522, App. A., pp. 76-81). Both methods necessarily involve estimated and assumed values. The fact of agreement in answers does not prove the accuracy of the determinations since both may be too high or too low accordingly as the estimated values are assumed at rates above or below correct amounts (Tr. p. 3644, App. A, pp. 63-65).

The question of the accuracy of these estimates is not of primary importance. *The controlling consideration is that this total water supply is not and cannot be measured.* There are over 20,000 square miles of drainage area in the Arkansas river basin in Colorado. Rain and snow fall over this entire area. Some of the water so precipitated collects in stream channels. Many of these channels never reach the river. The water may be lost through per-

colation, evaporation, or irrigation uses. Surely Colorado is not to be penalized because there are innumerable ranchers on the tributaries who make beneficial use of stream flows that in a state of nature never reached the Arkansas river. Under no theory of equity and justice can Kansas or the Colorado water users along the main stream, require that such uses on tributaries be limited or restricted in any way. By the literal wording of the Master's Decree, all these uses would have to be taken into consideration in arriving at Colorado's share of the water. This is wholly impracticable and unnecessary. *To use the entire basin water supply in Colorado as a basis for determining the interstate rights, is to apply an unsound formula and to arrive at a ridiculous result.* Surely the rights of the two states are not to be determined upon the basis of conflicting estimations and assumptions.

(c) The Recommendations of the Master as to Measuring Stations Reflect a Misconception of the Existing Conditions.

The Master recommends (Recommended Decree, Par. 4, p. 21) that "modern measuring devices at stations to accurately measure the water supply of the Arkansas river and the flow of the river and its tributaries" be established at Canon City, at the mouth of the Purgatoire river, and at the Colorado-Kansas state line. Patently, these stations can only measure the flow in the channel at the point where each is located. They could not, and do not, measure the entire water supply of the river and its tributaries.

There has been a stream measuring station at Canon City since 1888, at a point near the mouth of the Purgatoire since 1906, and at a point near the state line since 1908, (Tr. p. 22). Exhibits were introduced showing the flow at these stations during the period 1908 to 1938. For this period the average annual flow at Canon City adjusted for by-passed and imported water was 573,694 acre-feet (App. A, p. 61), at the mouth of the Purgatoire, 96,416 (Kansas Ex. 134, App. B, p. 61, Tr. p. 7019), and at the

state line, 260,700 acre-feet (Colorado Ex. 209, App. B, p. 61, Tr. p. 6640). The combined flow of the Canon City and Purgatoire stations averaged 670,380 acre-feet for this period and represented 60.39% of 1,110,000 acre-feet which the Master finds to be the average annual dependable water supply of the basin.

The Master makes no provision for any adjustment of the Canon City flow. There is water diverted just above the Canon City station for irrigation purposes and carried around the station so that it cannot be measured at the station. Such water should be added to the flow as measured. There are, above the Canon City station numerous importations, by private Colorado interests, of water to the Arkansas river from the basin of the Colorado river. The largest of these, the Twin Lakes, went into operation in 1935 and is designed to import approximately 50,000 acre-feet of water annually under average climatic conditions (Tr. p. 6567). Colorado Exhibit 194 (App. B, pp. 36-41, Tr. p. 6562), shows that these transmountain diversions into the Arkansas river basin averaged 7,683 acre-feet annually prior to 1930, and 28,596 acre-feet annually in the period 1931 to 1940. Proper regard for the Colorado enterprises constructing and owning these transmountain diversions, requires that the flow at Canon City be adjusted by the deduction of all imported water passing the gage. Otherwise, the measurement would not properly reflect the water supply of the Arkansas basin.

In fairness to Colorado, and to the private enterprises who have spent millions on these transmountain diversion projects, Kansas must not be awarded a proportionate part of any of the imported water flowing past Canon City. To give to Kansas any proportionate part of such flow would be to deprive the Colorado enterprises, owning the right to use such imported water, of their property without due process of law. These Colorado enterprises are not parties to this case. Moreover this case involves only the Arkansas river. There cannot here be made an equit-

able apportionment of water from a stream which does not flow to Kansas.[20]

There are located above Canon City, numerous storage reservoirs owned by Colorado enterprises (Tr: p. 383-385.) In these are stored winter flows and flood waters which otherwise could not be used. The flow at Canon City should be adjusted to take care of the storage and release of water in these reservoirs. Otherwise, the flow of the stream at Canon City is not properly reflected by the gage. Water is released from these reservoirs during times of scarcity in the irrigated plains area. To give Kansas a proportionate amount of the Canon City flow and to include in that flow the release from storage reservoirs is to give Kansas a greater amount of water in times of drouth that it would otherwise be entitled to receive. Likewise, at times when storage is going on in these reservoirs, Kansas will not receive its full proportionate share if adjustments are not made for the stored waters.

None of these conditions involving the measurements at Canon City is given any recognition by the Master. It is believed that Kansas will not deny the existence of this situation and the justice of the Colorado position in regard thereto. Its attorneys and engineers are fully aware of the facts.

The recommendation of the Master with respect to these stream gaging stations reflects a superficial treatment and a complete lack of understanding of the problem

[20] All transmountain diversions bringing water to the Arkansas are from the Colorado river. The use of the water of that stream is governed by the Colorado River Compact (House Document 605, 67th Congress, Fourth Session; Colo. Session Laws 1923, Chap. 189), the Boulder Canyon Project Act (45 Stat. 1057) and the Boulder Canyon Project Adjustment Act (54 Stat. 774). With reference to transmountain diversions the Colorado River Compact has been construed thus by the Solicitor of the Interior Department (Decision M-28389, approved by Secretary of Interior April 4, 1936—see Fed. Recl. Laws Annotated, 1936 ed., p. 399):

> "The Colorado River Compact authorizes diversion of Colorado River water into another watershed if such diverted water is to be used within the boundaries of the States through which the Colorado River system extends and if such use is not in excess of that allowed by the compact. The compact, however, does not authorize the diversion of waters of the Colorado River for use in States not included in either the upper or lower basin."

involved. Physical conditions must be accepted as they are. They should not be ignored.

(d) The Recommendations of the Master as to the Proportionate Division between States are Uncertain.

The Master recommends that average dependable supply of the river, which he finds to be 1,110,000 acre-feet, should be apportioned between the states on the basis that 925,000 acre-feet annually go to Colorado and 185,000 acre-feet annually go to Kansas. This is on a ratio of 5 to 1. We have heretofore shown that the combined flow of the stations at Canon City and the mouth of the Purgatoire river amounted to 670,380 acre-feet annually during the period 1908 to 1938 or 60.39% of the 1,110,000 acre-feet found by the Master to be the average annual dependable water supply.

The report of the Master does not state whether the 5 to 1 ratio applies to these so-called index flows. If it does apply, there is then no reason for the finding as to the 1,110,000 acre-feet figure. If it does not apply, then no percentage is given as to the amount of the index flow which Colorado is required to pass to Kansas. In its exceptions Kansas says that the index flows represent 54% of the water supply of the basin (Exceptions, p. 12). This is based upon the testimony of the witness Meeker who compared what he found to be the total water supply to the combined flows of the index stations for the period 1912 to 1930. The 185,000 acre-feet figure which the Master found to be Kansas' share represents 30.87% of the index flows computed on this basis. If the amount of the combined index flows for the period 1908 to 1938 as shown on Kansas Exhibit 134 (670,380 acre-feet), is compared to 1,110,000 acre-feet found by the Master to be the average annual dependable supply, the percentage is 60.39% and the Kansas share would then be 27.59% of the index flows.

It thus appears that there are three possible interpretations of the Report so far as the requirements of delivery to Kansas are concerned, namely, (1) one-sixth or 16.67% of the combined index flows; (2) 30.87% of the

combined index flows; (3) 27.59% of the combined index flows.

Since the Master made no mention anywhere in his report of the figures mentioned in items 2 and 3 above, it would seem that he must have meant that Kansas was entitled to receive one-sixth or 16.67% of the combined index flows. If his intention had been otherwise, it is reasonable to assume that he would have made some finding in his report of the percentage which he deemed proper. Surely the Master did not intend to leave this important matter for future speculation.

One further difficulty should be mentioned. The Master recommends (Recommended Decree, Par. 2, p. 20) that, of the 185,000 acre-feet allotted annually to Kansas, 150,000 acre-feet should be delivered during the period April 1 to October 1; and 35,000 acre-feet during the period October 1 to April 1. No such division is made for the Colorado share of the river supply. Hence it is impossible to obtain any percentage relationship between the two states on a summer or winter basis. No figure is given for Colorado which can be related to the definite figure for Kansas. In other words, under the Master's recommendation the only relationship which can be established is on an annual basis. If this was not his intention, then he would surely have found and used some definite figures. The patent ambiguity which exists must be clarified if there is to be a workable decree.

(e) The Recommendations of the Master with Relation to Flood Waters are Uncertain and Afford No Workable Plan for the Apportionment of Such Flood Waters.

By his Finding of Fact, paragraphs Second, Third and Tenth, (Report, pp. 4, 6, 11) the Master recognizes the occurrence of flood waters along the Arkansas river. These are dealt with by Paragraph 3 of Recommended Decree which reads thus:

> "It is further considered, ordered and decreed, that the flood waters of the Arkansas River and its

tributaries may be controlled and applied to beneficial use by either of the states of Colorado and Kansas in the respective amounts awarded to them as such flood waters flow in the river and its tributaries in the States."

Nowhere in the Master's Report is there anything to indicate what distinguishes flood waters from what he denominates "annual dependable water supply." In order for the Recommended Decree to be effective some line of demarcation must be established. To illustrate the situation attention is directed to the fact that the Master (Par. 4 of the Recommended Decree) provides for gaging stations at Canon City and the mouth of the Purgatoire "to measure accurately the water supply of the Arkansas river and the flow of the river and its tributaries." Kansas by its exceptions (Exception 3 to Recommended Decree, page 24) advances the idea that all amounts of water passing the state line station in quantities larger than the amounts accruing daily to Kansas by a proportionate division of the index flows should be classed as flood waters. Such a concept is contrary to the commonly accepted idea of flood waters and is grossly unfair to the State of Colorado. It would throw into the category of flood waters water accruing to the stream below the so-called index stations regardless of whether such water resulted from ordinary precipitation in normal and usual quantities or return flow from the Colorado irrigated acreage. A flood has been defined as a body of water covering land not usually innundated. Unless it can be said that any flow of water down the dry and sandy bed of the Arkansas constitutes a flood, the position of Kansas cannot be sustained.

For flood waters to be of any value whatsoever for irrigation they must be conserved by storage reservoirs and released during a time of need. There is only one reservoir along the main channel of the Arkansas river where such conservation is possible. It is the Caddoa Reservoir and Dam constructed by the Corps of Engineers of the United States Army. We shall later discuss the position and effect of Caddoa in this interstate controversy.

(f) The Master's Recommended Decree conflicts with his Findings of Fact and Conclusions of Law as to the Delivery of Water and is Unworkable and Grossly Unfair to the State of Colorado.

Paragraph Two of the Recommended Decree (Report p. 20) states there is awarded to Kansas 185,000 acre-feet of water annually of which 150,000 acre-feet shall be delivered at the state line during the season April 1 to October 1, and 35,000 acre-feet during the season October 1 to April 1 "at such times and in such amounts as and when required by water officials of the State of Kansas." Paragraph Nine of the Findings of Fact (Report p. 11) reads that Kansas is entitled to water in the same amounts stated in Paragraph Two of the Decree, after which this statement follows, "at such times and in such amounts of the 35,000 acre-feet as the same could be delivered for irrigation or storage when required by the water officials of Kansas."

Paragraph Three of the Conclusions of Law states that there should be awarded to Kansas the same amounts of water mentioned in Paragraph Two of the Decree and then reads, "at such times and in such amounts of the 35,000 acre-feet as the same could be delivered for irrigation or storage when required by the water officials of Kansas."

It thus appears that in the Findings of Fact and Conclusions of Law only the 35,000 acre-feet of winter water must be delivered by Colorado when required by the Kansas officials. However, the literal wording of Paragraph Two of the Decree seems to be that the entire 185,000 acre-feet awarded annually to Kansas must be delivered in accordance with the demands of the Kansas officials. Thus there is a patent ambiguity between the Recommended Decree and the Findings of Fact and Conclusions of Law as to whether or not the summer water must be delivered by Colorado in accordance with Kansas' demands.

If the Report and Decree are construed so as to require the delivery by Colorado of the entire annual amount

when required, then the decree conflicts with the findings of the Master as to the extreme variability of the flow. In Paragraph Second of the Findings (Report p. 5) the Master states, "the character of the flow of the river in Colorado is variable from year to year and season to season and day to day, and the main river at any one point may be almost without water one day and have a flood in it the next day and the following day have practically its original condition." In Paragraph Third of the Findings (Report p. 6) the Master says, "The character of the flow of the river in Colorado is widely variable from year to year and season to season, and its general flow divides itself into three groups, or kinds of flow, namely: First, the perennial flow from the high mountains consisting of melting snows in the mountains, varying almost from day to day. Second, the intermittent flow, resulting from intense rainstorms on plains area, and, Third, a more or less constant flow varying slightly from year to year and from month to month due to return seepage from irrigated lands."

A variable flow cannot be delivered when required. Colorado is without power to make the rains fall and the snows melt at such times as will satisfy the whims or the needs of the Kansas irrigators. *Natural phenomena are not susceptible of control by court decree.*

The only facility for any regulation of the flow of the Arkansas river is Caddoa Reservoir. This reservoir was wholly financed by the Federal government. There is no statutory or contractural authority for any regulation of the release gates of this reservoir upon the request of officials or water users of either state.

Under the conditions which existed prior to the advent of irrigation, Kansas did not have a regulated water supply. The flow of the stream occurred only as nature made it occur. The record shows that at many times during the summer season the stream bed was dry in Kansas (Tr. pp. 3361-3374). We say with confidence that it is not an equitable apportionment to require an upper state to provide for a lower state a supply of water of greater

certainty and regularity than occurred under virgin stream flow conditions. Colorado must take the water as it is produced by nature. The Colorado irrigators receive water when it is available for them in the stream, not when required for crop production under ideal conditions. Kansas is entitled to no preferential treatment.

4.

THE APPORTIONMENT RECOMMENDED BY THE MASTER ALLOCATES TO KANSAS MORE THAN ITS EQUITABLE SHARE OF THE BENEFITS OF THE FLOW OF THE INTERSTATE STREAM.

(a) The Nature of Equitable Apportionment.

The principle of equitable apportionment, first stated by this Court in *Kansas v. Colorado*, 206 U. S. 46, 100, 117, was thus elucidated in *Connecticut v. Massachusetts*, 282 U. S. 660, 670:

> "For the decision of suits between states, federal, state and international law are considered and applied by this court as the exigencies of the particular case may require. The determination of the relative rights of contending states in respect to the use of streams flowing through them does not depend upon the same considerations and is not governed by the same rules of law that are applied in such states for the solution of similar questions of private right. • • • And, while the municipal law relating to like questions between individuals is to be taken into account, it is not to be deemed to have controlling weight. As was shown in *Kansas v. Colorado*, 206 U. S. 46, 100, (27 S. Ct. 655, 51 L. Ed. 956), such disputes are to be settled on the basis of equality of right. But this is not to say that there must be an equal division of the waters of an interstate stream among the states through which it flows. It means that the principles of right and equity shall be applied having regard to the 'equal level or plane on which all the states stand,

in point of power and right under our constitutional system' and that, upon a consideration of the pertinent laws of the contending states and all other relevant facts, this court will determine what is an equitable apportionment of the use of such waters."

An apt comment on the rule was made in *New Jersey v. New York*, 283 U. S. 336, 342, 51 S. Ct. 478, from which we quote:

> "Both states have real and substantial interests in the river that must be reconciled as best they may be. The different traditions and practices in different parts of the country may lead to varying results but the effort always is to secure an equitable apportionment without quibbling over formulas.

In the practical application of the rule of equitable apportionment several guiding principles have been indicated by decisions of this Court. Perhaps the most important of these is the principle that existing economic development should be protected and preserved whenever possible. This was a controlling factor in the case of *Washington v. Oregon*, 297 U. S. 517, 523, 56 S. Ct. 545 wherein the Court said:

> "To restrain the diversions * * * would bring distress and even ruin to a long-established settlement of tillers of the soil for no other or better purpose than to vindicate a barren right. This is not the high equity that moves the conscience of the court in giving judgment between states. * * * Far from being that, it is rather 'the *summum jus* of power'. In default of reasons for removal more urgent and compelling, the tillers of the soil will be left where they have settled."

A second principle is that inchoate rights dependent upon possible future development furnish no basis for a decree in an interstate suit. This was established in the case of *Arizona v. California*, 283 U. S. 423, 462, 51 S. Ct. 528. There Arizona sought relief against the threatened

invasion of its alleged rights to prohibit and prevent appropriation under its laws of the unappropriated waters of the Colorado river flowing within its borders. This Court, after holding that the contention could not prevail because it was based upon an assumed potential invasion of Arizona rights, said, (283 U. S. 463-464):

> "There is no occasion for determining now Arizona's rights to interstate or local waters which have not yet been, and which may never be, appropriated."

This Court has repeatedly held that it will not issue declaratory decrees (*Alabama v. Arizona*, 291 U. S. 286, 291, 54 S. Ct. 399, 401; *United States v. West Virginia*, 295 U. S. 463, 474, 55 S. Ct. 798, 793; *Massachusetts v. Missouri*, 308 U. S. 1, 15, 60 S. Ct. 39, 42). A decision which attempts to apportion between states rights of use which have not attached is clearly and unmistakably a declaratory judgment. The apportionment of inchoate rights by court decree would create a multitude of unknown hazards. A court must predicate its decision upon actualities, not upon unpredictable future possibilities. It is apparent that, in spite of the application of the best available knowledge on economic and engineering matters, future development may nevertheless contrarily take a different line than that determined by a court. In other words, as a result of human ingenuity and energy, there may be a development in one state that puts to beneficial use water which by a decree operating *in futuro* has been apportioned to another state. It would seem clear that there should be no decree which would permit water to flow out of the basin unused merely because the court allotted it to a state which could not or would not use it.

A third cardinal principle is that each state is obligated to conserve the common supply of an interstate stream. In *Wyoming v. Colorado* 259 U. S. 419, 484 *et seq.* the Court pointed out that a fairly constant and dependable stream flow materially in excess of the lowest might be obtained by means of reservoirs to conserve and utilize

the flow, and stated that it regarded this view as reasonable. After commenting upon the position of Wyoming that it should not be required to provide storage facilities in order that Colorado might obtain a larger amount from the common supply than would otherwise be possible, the Court said (259 U. S. 484):

> "Both states recognize that conservation within practicable limits is essential, in order that needless waste may be prevented and the largest feasible use may be secured. This comports with the all-pervading spirit of the doctrine of appropriation, and takes appropriate heed of the natural necessities out of which it arose. We think that doctrine lays on each of these states a duty to exercise her right reasonably and in a manner calculated to conserve the common supply."

The burden of reservoir construction should not be placed entirely on one state. Yet, from a practical standpoint this is what has happened along the Arkansas. We have heretofore shown that the total decreed capacities of the approximately 200 reservoirs in Colorado amount to 653,427 acre-feet and that the capacity of the one irrigation reservoir in Kansas, Lake McKinnie, is 25,800 acre-feet. Thus Colorado has provided about 96% and Kansas about 4% of the storage space.

While the principle of equitable apportionment has been criticized because of its indefiniteness, that characteristic is, indeed, desirable. From a factual standpoint all streams are different. A formula which would be equitable for one stream might result in gross inequities when applied to another stream. However, certain general factors may be indicated as bearing upon the question of equitable apportionment.[21] Uses of water made in an

[21] These factors are suggested by Restatement of the Law of Torts, vol. IV, Chap. 41, p. 314 *et seq.* The Restatement applies the rule of "reasonable use" in determining rights between riparian proprietors. That rule is in many respects analogous to the rule of equitable apportionment between states.

upper state do not violate the rule unless the gravity of the harm to the lower state outweighs the utility of the use in the upper state. In determining utility of use consideration should be given to (1) the social value which the law attaches to the primary purpose for which the use is made, (2) the suitability of the use to the watercourse and to the customs and usages existing with respect to it, and (3) the impracticability of preventing the harm. Factors bearing on the gravity of harm are (1) the extent of the harm involved, (2) the social value which the law attaches to the particular type of use which is interfered with, (3) the suitability of such use to the particular watercourse, and (4) the burden on the state harmed of avoiding the harm.

An application of these tests to the situation along the Arkansas river will require that no decree be entered which will restrict or curtail the long-existing irrigation development in Colorado. That development has social value and represents a suitable use of the water flowing through the semi-arid region. Kansas has failed to show any harm except that which the Court held in its 1907 decision was insufficient to require a destruction of the benefits received by Colorado (206 U. S. 109). The Colorado use is not disproportionate, wasteful or unnecessarily harmful—and it is a prior use.

(b) The Report of the Master Shows on Its Face that the Recommended Apportionment would Result in taking Water from Established Colorado Uses for Kansas Lands that are not now Irrigated.

In Finding of Fact "Six" (Report p. 10) the Master states:

> "Both states have appropriated *all* of the natural flow of the Arkansas River and its tributaries."

In Finding of Fact "Nine", entitled "Amount of water Awarded To The State of Kansas" (Report p. 11), the Master states:

"• • • there should be awarded and delivered to the State of Kansas, at the Colorado-Kansas state line, 185,000 acre feet annually of the average annual dependable water supply and flow of the river stream for the irrigation in Kansas of the lands now being irrigated, *and for lands to be irrigated*, and lands irrigated from the waters of the Arkansas River prior to the time the State of Colorado increased her development in irrigation • • •."

There is no finding by the Master of any waste by Colorado in the irrigation practices followed in that state. Kansas does not except to the failure of the Master to make such a finding. The conclusion is thus justified (in fact it is required by the evidence) that Colorado has not been wastefully using water. The Master finds the stream to be over-appropriated. In other words the existing water rights exceed the flow of the stream. Then in his apportionment to Kansas the Master awards water "for lands to be irrigated." When the supply is used by existing rights, none remains for future uses on land not now irrigated. No process of legal legerdemain will get more water into the stream than nature produces.

It is obvious that the principle which requires the protection and preservation of existing economic development whenever possible is violated when water is taken from existing Colorado uses for land not now irrigated in Kansas.

(c) The Award of Water to Kansas for Use in Possible Future Development is Improper as it Constitutes the Recognition of an Inchoate Right.

As we have just pointed out the Master recommends that water be awarded to Kansas "for lands to be irrigated." No finding is made as to the extent of such lands or the amount of water required for their successful irrigation. Kansas in its exception VI (pp. 6-7) requests that the following additional finding be made:

"That the extent of land which could be irrigated in Kansas from ditches and laterals heretofore constructed, amounts to approximately 414,000 acres, the development of which was rendered impossible by Colorado's water diversions."

Colorado asserts that there is no evidence in the record that any such amount of land as mentioned in the Kansas exception has ever been irrigated in the Arkansas basin in that state. Indeed as we have heretofore pointed out the irrefutable evidence is that the Kansas irrigated acreage in the five western counties which are crossed by the Arkansas river was:

Year	Acreage
1889	17,572
1899	18,570
1909	34,879
1919	41,485
1929	60,897
1939	64,104

Thus it is plain that to award Kansas water for irrigation of additional land is to recognize an inchoate right dependent upon possible future development which may never take place. We say that no argument is required upon the proposition that water should not be taken away from existing Colorado uses so that at some indefinite time in the future additional land in Kansas may possibly be irrigated. *The tillers of the soil may well be left where they have settled. There is certainly no equity in removing them from Colorado to Kansas.* The interests of the national welfare surely are opposed to the abandonment of Colorado irrigation enterprises merely so that new development may be made in Kansas.

(d) The Award Recommended to be Made to Kansas is Excessive Since Kansas is not Now Making Full Use of the Water which it has.

Colorado Ex. 212 (App. B, p. 64, Tr. p. 6651) shows that the flow of the Arkansas river at Garden City, the eastern terminus of the area wherein there is irrigation

from the surface flows of the Arkansas, averaged 171,000 acre-feet annually in the period 1908-1938. Because of the failure of Kansas to keep adequate records, the values shown in this Colorado exhibit are calculated for the period 1908-1922, but Kansas has introduced no evidence contesting their accuracy.

The witness Patterson estimated that of this Garden City flow during the 1908-1938 period 85,000 feet of divertible water was unused on an annual average (Tr. pp. 6645-6651; App. A, p. 116). No contradictory evidence was interposed by Kansas.

Kansas has constructed but one storage reservoir, Lake McKinnie, capacity 25,800 acre-feet, for the conservation of water. Sites are available for additional reservoirs (Tr. pp. 3313-3320, App. A, p. 114).

Under the rule of *Wyoming v. Colorado, supra*, Kansas must utilize its local supplies and facilities before calling upon Colorado, the upstream state, for more water. The failure of Kansas so to do makes any award to it of additional water from Colorado an inequitable apportionment of the benefits of the flow of the interstate stream.

(e) The Recommended Apportionment is Inequitable Since it Utterly Disregards the 1916 Settlement and the Stipulation of 1933.

(i) The 1916 Settlement.

The rights of individual water users are important in a case such as this because the right of the state is the total of the rights of all its water users. As has been well said, the rights of the states are "indissolubly linked" with the rights of its water users (*Wyoming v. Colorado*, 259 U. S. 419, 468). The Master so finds in this case (Report p. 22).

We have heretofore pointed out that the Kansas enterprises operating irrigating ditches diverting Arkansas

river water consist of the state line group of three small ditches and the Garden City group of five rather large ditches. So far as the state line group is concerned there is no showing that they are not receiving an adequate supply or that they could use a greater supply of water.

Turning then to the Garden City ditches, we have directed attention to the fact that the law suit started by The United States Irrigating Company against individual water users in the federal court was settled by a stipulation in 1916 to which all the Garden City ditches but one, the Farmers ditch owned by The Finney County Water Users' Association, agreed. By this settlement the Kansas ditches agreed to accept the priority date of August 27, 1910, and the quantities of water specified, as a definition and determination of their relative rights as against the rights of appropriators in Colorado taking water from the Arkansas river and its tributaries (Colo. Ex. 148, Tr. p. 3517). Kansas has not shown that these ditches have been deprived of water by any Colorado diversions having a date junior to August 27, 1910.

In *Wyoming v. Colorado*, 259 U. S. 419, this Court discussed at length the priorities in Colorado and Wyoming along the Laramie river and by such procedure determined the existing uses in the two states which it considered should be protected from loss by reason of the proposed Colorado project which Wyoming sought to enjoin. The weight which the Court there gave to priorities as an important factor in determining the total rights of the states is apparent. Applying the same principle here, the Kansas ditches accepted the 1910 date for their priorities. Under an interstate application of the priority doctrine, those ditches could not require the closing of senior Colorado ditches in order to obtain water.

Colorado does not here argue for interstate priorities. In fact the Colorado position is that interstate priorities do not in and of themselves constitute a true and work-

able basis for equitable apportionment.[22] The 1916 settlement is important here because thereby the signatory Kansas ditches subordinated their development and rights to all Colorado uses with priorities senior to August 27, 1910. Surely the state of Kansas cannot now come to the aid of these Kansas ditches and by the repudiation on their behalf of the 1916 settlement obtain more water for them.

While the owners of the Farmers ditch did not execute the 1916 settlement, they were parties to the Kansas rotation agreement. It will be recalled that all the Garden City ditches, including the Farmers, rotate the available water supply (Tr. p. 3534). Hence, whatever water might be secured by reason of the Farmers ditch use would redound to the benefit of all the ditches in that group. Thus the ditches which signed the 1916 settlement would obtain water in addition to that which would have otherwise been available to them under the 1916 settlement. We say that in this interstate suit Kansas may not use the Farmers ditch merely as an excuse for attempting to get more water for the other ditches which did in 1916 finally settle their dispute with the Colorado water users. Kansas should not be allowed to obtain water to satisfy rights lawfully waived for ample consideration by its constituents whose rights are "indissolubly linked" with its own.

(ii) The 1933 Stipulation.

The nature of the 1933 stipulation and the circumstances surrounding its execution are described elsewhere in this brief. It is sufficient to point out here that in section two thereof the amount of water necessary to maintain the *status quo* of the Kansas diversions is

> "a quantity of water up to 77,000 acre-feet annually of which amount 52,000 acre-feet thereof shall be de-

[22] The question of the establishment of an interstate priority schedule as a means of making an equitable apportionment is one of the chief issues in *Nebraska v. Wyoming*, the interstate case involving the North Platte river now pending in this Court. There Nebraska argues for an interstate priority schedule and Colorado, Wyoming and the United States contend otherwise.

livered to the state line during the irrigation season from April 1 to October 1 of each year as and when required by the Kansas State water officials, and 25,000 acre-feet thereof to be delivered during the non-irrigation season from October 1 to April 1 at such times and in such amounts as same could be diverted and used for irrigation or storage."

In 1933 the responsible Kansas officials and the counsel for the defendants in this case agreed that 77,000 acre-feet of water annually would maintain the *status quo* of the Kansas diversions. There is no evidence in the record to the effect that the situation has changed since 1933.

It is plain that if 77,000 acre-feet will maintain the *status quo*, then the additional water awarded Kansas by the Master (108,000 acre-feet on the annual average) is for future development not now existing. There is no equity in a requirement that Colorado deliver such an amount of water to Kansas for uses which may or may not be made in the future. A decree which imposes such a requirement is most certainly a declaration of future rights, the very existence of which is entirely dependent upon what may happen many years from now.

(f) The Recommended Apportionment Would Require Colorado to Forego Present Uses in Order to Deliver Water to Kansas at the State Line.

We have heretofore presented our argument upon the proposition that the Recommended Decree of the Master is ambiguous, uncertain and unworkable. Nothing presented in this section of the brief constitutes any waiver of that argument.

Kansas, in its exceptions, presents the contention that the intent of the Recommendations of the Master is that the Kansas share of the water resources of the Arkansas river constitutes that per cent of the combined stream flows of the Arkansas river at Canon City and the Purgatoire river at its mouth, as will amount to an average of

185,000 acre-feet annually. If such is the intent of the Recommended Decree, and we deny that it is, then Colorado will have to forego present uses in order to satisfy the obligation to deliver the required amounts at the state line.

(i) Under Historical Conditions Substantial Deficiencies Would Have Occurred in State Line Flows if the Recommendation of the Master as Interpreted by Kansas had been in Effect.

The great fallacy of the recommendation is that it deals with average annual amounts and yet contains no provision for carrying over from year to year credits or debits for over or under deliveries.[23] The use of averages is improper unless there is provision for continuous accounting so that the averages cover periods of sufficient length to embrace all climatic cycles. An example will make our position plain.

The following tables cover the period 1908-1938. The state line flows are taken from Colo. Ex. 204 (App. B, pp. 54-58). The delivery obligations are calculated from Kansas Exhibit 134 (App. B, p. 73) by the application of the percentage relationship between the combined flow at the Canon City and Purgatoire stations (670,380 acre feet) and the finding of the Master as to the "average annual dependable supply (1,110,000 acre feet). The percentage

[23]Engineering water studies must be based upon averages. Since no one can forecast with certainty future climatic conditions, these studies must be predicated upon the assumption that natural phenomena tend to repeat or reoccur and hence an average over one period of substantial length will reoccur over another period of about the same number of years. The longer the period covered the more reliable and useful will be the average computed therefrom. To require an average flow to be delivered each year is to disregard the natural fluctuations from the average. Correct use of averages necessitates either the use of a period covering a number of years, for example, 10 years as in the Colorado River Compact (45 Stat. 1057), or the use of a system of credits and debits as in the Rio Grande Compact (53 Stat. 785). By the latter method the upstream state is credited with deliveries in excess of the required amount and debited with deliveries of less than that amount, but limitations are commonly placed upon the amounts of either debits or credits which may be accrued and the length of time for which they may be held without a balancing of accounts. For a criticism of the use of averages see *Wyoming v. Colorado*, 259 U. S. 419, 480.

so computed is 27.6. The assumption is made, as contended for in the Kansas exceptions, that state line flows in excess of the Kansas percentage of the so-called index flows are not chargeable. The difference between the chargeable state line flows and the annual delivery obligations constitutes a deficiency which, during the period mentioned, would have had to be made up by the curtailment of Colorado uses.

TABLE 1

Stateline Flows and Calculated Delivery Obligations

Period 1908-1938: Units 1000 A.F.

Calendar Years	Stateline Flows (Colo. Ex. 204)			Delivery Obligations		
	Annual	Summer	Winter	Annual	Summer (a)	Winter (b)
1908	560.8	44.9	515.9	132.5	107.4	25.1
1909	251.4	189.4	62.0	236.6	191.8	44.8
1910	119.4	77.5	41.9	178.0	144.3	33.7
1911	107.2	47.8	59.4	205.4	166.5	38.9
1912	227.2	134.0	88.7	210.1	170.4	39.7
1913	115.3	33.1	82.2	142.9	115.9	27.0
1914	576.5	527.8	48.7	255.7	207.3	48.4
1915	495.7	429.7	66.0	198.8	161.2	37.6
1916	144.3	69.9	74.4	206.2	167.2	39.0
1917	59.4	19.0	40.4	202.1	163.9	38.2
1918	58.9	26.3	32.6	197.8	160.4	37.4
1919	225.9	149.5	76.4	205.0	166.2	38.8
1920	199.2	118.1	81.1	209.7	170.2	39.7
1921	961.4	901.0	60.4	221.5	179.6	41.9
1922	93.7	36.1	57.6	161.7	131.1	30.6
1923	800.8	589.1	211.7	301.5	244.5	57.0
1924	292.6	103.5	189.1	200.3	162.4	37.9
1925	254.0	190.5	63.5	142.8	115.8	27.0
1926	102.8	54.8	48.0	174.6	141.6	33.0
1927	452.8	403.1	49.7	222.3	180.2	42.1
1928	264.2	201.5	62.7	189.0	153.2	35.8
1929	250.8	159.8	91.0	209.8	170.1	39.7
1930	205.5	67.1	138.4	176.8	143.4	33.4
1931	107.2	37.9	69.3	110.7	89.8	20.9
1932	58.3	30.1	28.2	149.3	121.1	28.2
1933	172.9	146.6	26.3	142.4	115.5	26.9
1934	54.1	32.9	21.2	93.9	76.1	17.8
1935	193.2	175.5	17.7	161.3	130.8	30.5
1936	345.0	313.0	32.0	191.6	155.4	36.2
1937	132.3	108.9	23.4	134.9	109.4	25.5
1938	204.5	174.6	29.9	170.8	138.5	32.3
Avge.	260.7	180.4	80.3	185.0	150.0	35.0

(a) At ratio to annual of 150:185.

(b) At ratio to annual of 35:185.

TABLE 2

Chargeable and Non-Chargeable Stateline Flows

Period 1908-1938: Units 1000 A.F.

Calendar Years	Non-Chargeable Flows			Chargeable Flows (a)		
	Winter	Summer	Annual	Winter	Summer	Annual
1908	490.8	.....	490.8	25.1	44.9	70.0
1909	17.2	.....	17.2	44.8	189.4	234.2
1910	8.2	.....	8.2	33.7	77.5	111.2
1911	20.5	.....	20.5	38.9	47.8	86.7
1912	49.0	.....	49.0	39.7	134.0	173.7
1913	55.2	.....	55.2	27.0	33.1	60.1
1914	0.3	320.5	320.8	48.4	207.3	255.7
1915	28.4	268.5	296.9	37.6	161.2	198.8
1916	30.9	.....	30.9	39.0	69.9	108.9
1917	2.2	.....	2.2	38.2	19.0	57.2
1918	.....	.....	.....	32.6	26.3	58.9
1919	37.6	.....	37.6	38.8	149.5	188.3
1920	41.2	.....	41.2	39.7	118.1	157.8
1921	18.5	721.4	739.9	41.9	179.6	221.5
1922	27.0	.....	27.0	30.6	36.1	66.7
1923	154.7	344.6	499.3	57.0	244.5	301.5
1924	151.2	.....	151.2	37.9	103.5	141.4
1925	36.5	74.7	111.2	27.0	115.8	142.8
1926	15.0	.....	15.0	33.0	54.8	87.8
1927	7.6	222.9	230.5	42.1	180.2	222.3
1928	26.9	48.3	75.2	35.8	153.2	189.0
1929	51.3	.....	51.3	39.7	159.8	199.5
1930	115.0	.....	115.0	23.4	67.1	90.5
1931	48.4	.....	48.4	20.9	37.9	58.8
1932	.....	.....	.....	28.2	30.1	58.3
1933	.....	31.1	31.1	26.3	115.5	141.8
1934	3.4	.....	3.4	17.8	32.9	50.7
1935	.....	44.7	44.7	19.7	130.8	148.5
1936	.....	157.6	157.6	32.0	155.4	187.4
1937	.....	.....	.....	23.4	108.9	132.3
1938	.....	36.1	36.1	29.9	138.5	168.4
Avge.	46.4	73.3	119.7	33.8	107.2	141.0

(a) Assuming all Stateline Flows, regardless of rates and times of occurrence, are chargeable up to the amounts of the season delivery obligation.

TABLE 3

State Line Flows—Annual Excess and Deficiency

Period 1908-1938: Units 1000 A.F.

	Annual State Line Flows			Annual Delivery Obligation	Deficiency (b)
	Totals	Non-Chargeable	Chargeable (a)		
1908	560.8	490.8	70.0	132.5	62.5
1909	251.4	17.2	234.2	236.6	2.4
1910	119.4	8.2	111.2	178.0	66.8
1911	107.2	20.5	86.7	205.4	118.7
1912	227.2	49.0	173.7	210.1	36.4
1913	115.3	55.2	60.1	142.9	82.8
1914	576.5	320.8	255.7	255.7	.....
1915	495.7	296.9	198.8	198.8	.....
1916	144.3	30.9	108.9	206.2	97.3
1917	59.4	2.2	57.2	202.1	144.9
1918	58.9	.....	58.9	197.8	138.9
1919	225.9	37.6	188.3	205.0	16.7
1920	199.2	41.2	157.8	209.7	51.9
1921	961.4	739.9	221.5	221.5	.....
1922	93.7	27.0	66.7	161.7	95.0
1923	800.8	499.3	301.5	301.5	.....
1924	292.6	151.2	141.4	200.3	58.9
1925	254.0	111.2	142.8	142.8	.....
1926	102.8	15.0	87.8	174.6	86.8
1927	452.8	230.5	222.3	222.3	.....
1928	264.2	75.2	189.0	189.0	.....
1929	250.8	51.3	199.5	209.8	10.3
1930	205.5	115.0	90.5	176.8	86.3
1931	107.2	48.4	58.8	110.7	51.9
1932	58.3	.....	58.3	149.3	91.0
1933	172.9	31.1	141.8	142.4	0.6
1934	54.1	3.4	50.7	93.9	43.2
1935	193.2	44.7	148.5	161.3	12.8
1936	345.0	157.6	187.4	191.6	4.2
1937	132.3	.....	132.3	134.9	2.6
1938	204.5	36.1	168.4	170.8	2.4
Avge.	260.7	119.7	141.0	185.0	44.0

(a) As defined in Table 2.

(b) Quantities called out of Colorado ditches in order to meet the specified delivery obligation.

It appears from the foregoing tables that if, during the 1908-1938 period, Colorado had been required to deliver to the state line 27.6% of the so-called index flows, it would have had to forego some of its existing uses in 24 of the 31 years. The average annual deficiency of the state line flows would have been 44,000 acre-feet and in three of the years the deficiencies would have exceeded

100,000 acre-feet. Of course, if instead of 27.6% the figure of 30.8%, contended for in the Kansas Exceptions, had been used, the deficiencies would have been greater.

Actually, under an example such as that given, the average annual amount of reduction in Colorado diversions would have had to exceed 44,000 acre-feet. If the diversions are reduced, the return flow is also reduced and the diversions would have to be further reduced to make up for the loss of return flow.

Also, it should be noted that the above tables are prepared upon the theory that Kansas is chargeable with all water crossing the state line up to the annual and seasonal percentages used of the so-called index flows. If further restrictions are imposed to satisfy the Kansas contention that the water be delivered as and when required, the deficiencies will be much greater.

(ii) There is No Relationship Between The So-Called Index Flows and The State Line Flow.

The recommendations of the Master and the contention of Kansas as indicated by its exceptions seem to be predicated upon the theory that there is a direct relationship between the so-called index flows and the state line flow. This is not true. The Canon City flows, which are approximately 85% of the index flows, consist largely of mountain run-off from melting snows. The state line flows are largely produced by plains floods. As shown by undisputed testimony, all the mountain run-off, both main river and tributary, has been diverted and used in Colorado by ditches constructed and operated for periods of 50 to 80 years (Tr. pp. 3376-3391). This Court in its 1907 opinion in this controversy (206 U. S. 106) recognized that ditches constructed along the Arkansas river in Colorado in 1890 and prior thereto had aggregate diversion capacities greatly in excess of the stream flows at Canon City. Hence they had appropriated all the Canon City flows plus substantially all of the tributary inflows except at times of major plains floods. Any requirement of de-

livery to Kansas of a percentage of the Canon City flows will necessarily mean that the diversions of Colorado ditches must be decreased.

The need for irrigation and the consumption of water by evaporation, transpiration and percolation, between the index stations proposed and the state line, are not constant from year to year, and they do not vary directly with stream flows and water supplies. Instead they are governed largely by climatic conditions, principally lack of precipitation, and are commonly greatest when water supplies are least.

The following table shows clearly the lack of relation between the so-called index flows and the state line flows. The index flows are from Kans. Ex. 134 (App. B, p. 73) and the state line flows from Colo. Ex. 209 (App. B, p. 61).

Year	Index Flows	State Line Flow	State Line Flow in Percent of Index Flow
1908	479,902	560,800	116.8
1909	857,090	251,400	29.3
1910	644,794	119,400	18.6
1911	744,341	107,200	14.5
1912	761,275	222,700	29.3
1913	517,678	115,300	22.2
1914	926,260	576,500	62.2
1915	720,260	495,700	68.8
1916	747,144	144,300	19.3
1917	732,385	59,400	8.1
1918	716,790	58,900	8.2
1919	742,780	225,900	30.4
1920	759,819	199,200	26.2
1921	802,406	961,400	119.8
1922	586,010	93,700	15.9
1923	1,092,294	800,800	73.3
1924	825,511	292,600	35.4
1925	517,456	254,000	49.0
1926	632,510	102,900	16.2
1927	805,474	452,900	56.2
1928	684,665	264,200	38.6
1929	760,064	250,800	32.9
1930	640,583	205,500	32.0
1931	401,150	107,200	26.7
1932	540,931	58,300	10.7
1933	515,932	173,000	33.5
1934	340,060	54,100	15.9
1935	584,331	193,200	33.0
1936	694,175	345,000	49.7
1937	488,699	132,300	27.0
1938	618,920	204,500	33.0

A mere glance at the above table is sufficient to see that there is no relationship whatsoever between the index flows and the state line flow. In two of the years the state line flows exceeded the index flows and in two other years amounted to less than ten percent thereof. The variation is so extreme that common sense requires recognition of the fact that any apportionment based upon a requirement of Colorado to deliver at the state line a percentage of the index flows runs contrary to natural physical facts.

(g) While Kansas Claims Additional Water From Colorado For Irrigation, The Kansas Law Is Such That There Is No Assurance That Additional Water Can Or Will Be So Used.

As we understand the Kansas position in this case, the basis of its demand is that it is allegedly entitled to water for the irrigation of additional lands. This demand is of questionable validity because of the Kansas law with reference to the use of water for irrigation.

Kansas has a statute (Laws of 1886, ch. 115; R. S. 42-101 *et seq.*) purporting to authorize the acquirement by appropriation of the right to use the water flowing in a stream. However, the Kansas Supreme Court has construed that statute as not applicable to destroy the riparian rights of lands patented before its enactment in 1886. We direct attention to the case of *Frizell v. Bindley*, 144 Kan. 84, 58 P. (2d) 95, wherein certain water users on Pawnee Creek, a tributary of the Arkansas, claimed prior appropriations as against upstream users. The defendants asserted that, since their lands were patented prior to 1886, riparian rights attached and appropriation rights asserted by downstream users were not good as against them. The Kansas Supreme Court held with the defendants, saying (144 Kan. 91):

> "By 1886, however, all the lands of the Pawnee valley of present concern had passed out of the public domain into private ownership under United States land patents or by mesne conveyances from the original patentees. As riparian owners, therefore, their

rights in and to the waters of Pawnee Creek were dependent on whatever was the law of this state at the time their land passed into private ownership. Those rights were such as attached to riparian lands at common law."

(p. 92) "In 1886 there was—and this Court takes judicial cognizance of the fact—a large amount of land in western Kansas which was still a part of the public domain, to which no private rights of proprietorship had attached. We are not now called on to decide whether the statute of 1886 is valid as applied to such lands afterwards patented or not."

Thus the holding of the highest court in Kansas is that on lands patented prior to 1886 riparian rights attach and that it makes no decision as to whether the 1886 statute is valid as to lands patented after 1886.[24]

There is no showing in this case as to what, if any, lands which are or may be irrigated in Kansas were patented prior or subsequent to 1886. Kansas Exception VI seeks to inject a finding of 414,000 acres of irrigable land in Kansas. There is no showing that under Kansas law water could be used for irrigation on this land. If the riparian doctrine applies, it probably cannot be because under that doctrine lands not bordering on the stream have no riparian rights.[25] The conservation and beneficial use of the waters of the Arkansas so as to preserve and protect the public welfare will be ill served if water is taken away from Colorado users who are actually irrigating and growing crops and then, because of the Kansas law, permitted to pass unused out of the irrigated section of the basin.

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[24] In a later Kansas case, *Smith v. Miller*, 147 Kan. 40, 42, 75 P. (2d) 273 (1938), it was said:

"Under the common law as frequently declared by this Court, water in the natural character of a running channel is an inseparable attribute of the land through which the stream flows. In legal parlance it is part and parcel of the land itself."

[25] See U. S. Department of Agriculture Misc. Pub. No. 418 "Selected Problems in the Law of Water Rights in the West" p. 46.

5.

THE EXISTENCE AND EFFECT OF CADDOA RESERVOIR ON THE REGIMEN OF THE FLOW OF THE STREAM MUST BE RECOGNIZED.

(a) A Description of Caddoa Reservoir.

Construction of Caddoa Dam and appurtenant works by the Corps of Engineers of the War Department was authorized by Congress in the Flood Control Act of June 22, 1936 (49 Stat. 1570). Maintenance and operation of the project after its completion were by the Flood Control Act of 1938 (52 Stat. 1215), placed under the supervision of the War Department, Corps of Engineers, United States Army. There are no provisions for any repayment obligation on the part of local interests benefited by the construction of the project. Work was begun in 1940 and is now practically completed, except for the installation of certain large flood release gates which cannot be obtained until the present war emergency permits the release of the strategic materials needed for them. Plans for Caddoa Reservoir contemplate a capacity of 655,000 acre-feet of which 270,000 acre-feet is reserved for flood control and 385,000 acre-feet is allotted to conservation storage. Because of the inability to install the flood release gates, the present available capacity is approximately 270,000 acre feet.

The Caddoa Dam is located across the channel of the Arkansas river about 58 miles above the state line. Obviously it cannot control or regulate the flow of the river caused by tributaries entering below and draining an area of 6,448 square miles in Colorado (Colo. Ex. 205), nor can it control the return flows from ditches and lands along the river between Caddoa and the state line. The reservoir might operate to cut off the flow of the river at that point except in such years as the flow exceeds the available storage capacity and except for the provision of the 1933 stipulation that the construction and operation of Caddoa shall not disturb the *status quo* of the diversion of water for beneficial uses from the river by the ditches

and canals now constructed and operated in both states. In spite of the conclusions of the Master, and until this Court holds otherwise, Colorado recognizes the stipulation as binding upon it.

Because of anticipated siltation Caddoa reservoir is estimated to have a limited life, the length of which will depend upon the occurrence of floods which wash down large deposits of silt to fill up the reservoir bed. Colorado witness Patterson estimated the effective life of the conservation pool at 60 to 82 years (Tr. p. 6687). The Kansas witness Knapp was inclined to accept the shorter period (Tr. p. 7003). The construction of other flood control dams above Caddoa would retard the deposit of silt and thus lengthen the effective life of Caddoa.

The conservation storage of water in Caddoa will have to be in conformity with Colorado law. The states possess control of the waters within their borders subject to the acknowledged jurisdiction of the United States under the commerce clause of the constitution (*U. S. v. Appalachian Power Co.* 113 U. S. 377, 405; *California-Oregon Power Co. v. Beaver Portland Cement Co.*, 295 U. S. 142, 163-164). No appropriation has been secured under Colorado law for any conservation storage of water in Caddoa. A more detailed description and discussion of Caddoa is found in Appendix A, pages 141-156.

(b) The Master Ignores The Effect of Caddoa Reservoir.

The Master disposes of Caddoa Reservoir by Paragraph Six of his Recommended Decree (Report p. 21) which reads:

> "It is further considered, ordered and decreed that the construction of the incompleted dam and reservoir in the channel of the Arkansas river known as the Caddoa reservoir, and the execution of the purported written stipulation of date December 18, 1933, by the officials, attorneys and engineers of the states of Colorado and Kansas are not binding upon either of the two states in the adjudication of an equitable

apportionment of the water supply of the Arkansas river and its tributaries between the two states."

This conforms with Paragraph Thirteen of the Findings of Fact and Paragraph Seven of the Conclusions of Law. (Report p. 16). The statement that the construction of this dam and reservoir is "not binding" upon either of the states indicates a total disregard of the real problem. The dam is there and it is bound to affect the flow of water. No arguments are required upon the proposition that Caddoa should be used for the best possible conservation and regulation of flows of the Arkansas river. The millions of dolars spent by the United States in its construction must not be casually thrown out the window. We believe that Kansas will not deny the fact that, at the time of the authorization of Caddoa and the appropriation of funds for its construction, the congressional delegations from both states acted under the belief that the construction of this dam and reservoir would afford a means of settling this long standing dispute between Kansas and Colorado.[26] Common sense requires that it be utilized to effectuate this desirable purpose.

(c) The Stipulation of 1933 Affords A Basis of using Caddoa Reservoir to Preserve the Existing Use and to Divide Equally the Potential Conservation Benefits.

Prior to the authorization and construction of Caddoa the officials and counsel for the parties to this case entered into a stipulation with reference to the operation and use of Caddoa reservoir.[27] When the Caddoa project was proposed by the Corps of Engineers, Colorado considered that because of the limitations on reservoir construction on the Arkansas below the mouth of the Purgatoire contained in the provisions of the 1916 settlement, it could

[26] See "Hearings before the Committee on Flood Control, House of Representatives, Seventy-Fifth Congress, Third Session," March 30 to April 19, 1938, pp. 704-706, 733-750.

[27] In this connection it should be noted that the statement of the Master in Paragraph Thirteen of the Findings of Fact (Report p. 13) that this stipulation was effected after the construction of Caddoa Dam is clearly an error.

not assent to the proposal without obtaining the approval of Kansas. In other words Colorado felt morally bound by the contract of 1916 which its water users had made with the Kansas water users. Subsequent negotiations resulted in the stipulation of December 18, 1933. Construction of Caddoa was authorized in 1938 and began in 1940.

The 1933 Stipulation recites (1) that the case is pending in the United States Supreme Court (2) that the construction of the Caddoa Reservoir by the United States is under consideration; (3) that it is the thought of the parties that the reservoir would "enable much of the water that flows in said river past the location of said proposed dam to be stored, regulated and conserved for beneficial use; (4) that the parties "recognize the advantages" to be gained from the reservoir "if assured of the protection not only to all rights which they now have and which are involved in the present controversy, but also to their existing water supply in the event said dam" should be constructed and operated prior to the entry of a decree in the pending case; and (5) that it is desirable to provide for the cooperation of the two states and The Finney County Water Users' Association in securing the construction of the dam.

By the stipulation it was agreed thus (App. B, pp. 30-35).

(1) Section One expressed the promise of the parties to use their influence to obtain the construction of the reservoir and then contained this provision:

> "said parties agree as between themselves to the allocation of the water that might be stored in said reservoir, as hereinafter set forth; it being understood that such allocation shall be subject to the storage and discharge of water stored in such reservoir by the United States of America in order to lessen or avoid damages from floods."

(2) Section Two provided for the allocation of the water and we shall quote it in its entirety:

"That the construction and operation of said dam and reservoir shall not disturb the status quo of the diversion of water for beneficial uses from said Arkansas River by the ditches and canals now constructed and operated in both of the states of Colorado and Kansas. IT IS UNDERSTOOD AND AGREED that in order to maintain the status quo of said diversion as hereinabove referred to there shall be allocated to the State of Kansas for delivery at the State line in the Arkansas River from Colorado into Kansas a quantity of water up to 77,000 acre-feet annually, of which amount 52,000 acre-feet thereof shall be delivered to the State line during the irrigation season from April 1 to October 1 of each year as and when required by the Kansas State water officials, and 25,000 acre-feet thereof to be delivered during the non-irrigating season from October 1 to April 1 at such times and in such amounts as same could be diverted and used for irrigation or storage; and for irrigation of lands in Colorado below said reservoir a quantity of water up to 160,000 acre-feet annually."

(3) Section Three provided that when the river flows below the dam should be insufficient to supply the total amount allocated by Section Two, "then in that event the said waters shall be prorated between Colorado and Kansas in the relation hereinabove in paragraph 2 hereof set forth."

(4) Section Four provides for the allocation of surplus water and we shall quote it in full:

"After the allocation of water as provided in the next preceding paragraphs, all additional water which may be impounded in said reservoir, excepting always the amounts of water discharged for flood control purposes, hereinafter referred to, shall constitute surplus and shall be allocated one-half to Colorado and one-half to Kansas, said surplus to be determined April 1, annually, or such other date as may be mutually agreed upon by water officials of the two

States, and the amount allocated to each State shall be discharged from said reservoir from time to time on request of the Water Officials of each State respectively for the water allocated to it, but the release of such water on demand shall not be considered as constituting any part of the amounts specified in paragraph 2 herein."

(5) Section Five provided that any exchanges of water between Colorado ditches located below and above the reservoir shall be made only out of surplus and shall be charged against Colorado's share of the surplus.

(6) Section Six stated that reservoir flood releases shall not be charged against either state unless such releases coincide with a request by a state.

(7) Section Seven makes the provisions for allocation of water effective "when such dam shall have been constructed and water begun to be stored in said reservoir."

(8) Section Eight provides:

"This Stipulation is without prejudice to the claims of either party hereto in the above entitled case, and shall be subject to the decision of the Supreme Court of the United States as to the respective rights of the parties hereto to water flowing in the Arkansas river, or stored in said reservoir."

(9) Section Nine gives joint control of the storage and discharge of reservoir waters to the two states.

Colorado says that the stipulation represents a method of allocation of water which all parties thought to be equitable at the time of execution. Certainly it would not have been signed if the parties had not considered it fair and equitable. The attitude of Kansas throughout this prolonged litigation would not indicate that the stipulation was agreed to out of a mere feeling of neighborly love. If the Kansas officials had thought for one moment that the stipulation did not contain a fair and proper allocation of water, they would not have signed it. That is a

certainty. It is also a certainty that there has been no change of conditions along the Arkansas river since 1933 which makes inequitable now an allocation which was equitable then.

Section Eight says specifically that the stipulation shall be subject to the decision of the court in this case. Such provision was both necessary and proper. We apprehend that the parties may not write a decree for the court. Section Eight merely recognizes this fact. True it is that the stipulation has no absolute finality so far as this dispute is concerned. Interstate controversies may be settled only by compact with the approval of Congress or by decision of this court. The stipulation is not a compact and it was never approved by the state legislatures nor ratified by Congress. But the stipulation most certainly constitutes an expression of what the responsible officials of these two states considered to be an equitable allocation of water. As such it must be given great weight.

Public officials are assumed to do their duty and to be prompted by legitimate motives (*Louisiana v. Texas*, 176 U. S. 1, 23, 20 S. Ct. 251, 257). Hence, the governors, attorneys general and engineers of these two states must have acted with the rights and the welfare of their respective states in mind when they entered into this stipulation. Certainly there is no evidence to the contrary.

Colorado introduced evidence to show that the provisions of the Stipulation of 1933 could be put into practical effect so as to maintain the *status quo* and afford to each state an equal division of the conservation benefits made possible by Caddoa Reservoir. For this purpose Colorado introduced through its witness Patterson its so-called Operation Plan F, which is simply a suggested method of administering the river in such a manner as to carry out both the letter and the spirit of the 1933 Stipulation. It is not necessary to go into the details of Plan F.

Colorado witness Patterson who testified as to Operation Plan F presented Colorado Exhibit 226 (App. B, p. 71) to show the comparative conservation benefits which

would accrue to the states under administration in accordance with Plan F for a thirty-one year period comparable to that existing in 1908-1938. It appears in this exhibit that the annual average Kansas benefit would be 39,600 acre-feet, or 52.5% of the total and the average annual Colorado benefit 35,900 acre-feet or 47.5% of the total conservation benefit. The only evidence adduced by Kansas in opposition to Plan F tended to show that in certain months and under certain conditions Colorado would have an advantage (Tr. p. 6981). While this is true it is likewise true that in other months and under other conditions the advantage was to Kansas. When the 31-year period is averaged out, Kansas definitely had the edge.

Colorado presented Plan F to show that Caddoa Reservoir could be operated to maintain the *status quo* and divide evenly the conservation benefits made possible by Caddoa. It is the Colorado idea that Caddoa should be used and not disregarded. Kansas presented no evidence whatsoever which made any suggestion as to what, if anything, should be done with Caddoa.

6.

IN NUMEROUS MINOR MATTERS THE REPORT OF THE MASTER IS EITHER INCOMPLETE OR INCORRECT AND HENCE SHOULD NOT BE ACCEPTED.

(a) The Provisions of the Recommended Decree that the States Each Own Certain Quantities of Water are Erroneous.

The Master in Paragraphs One and Two of the Recommended Decree (Report Pages 19-20) says that each of the respective states "is awarded, granted and decreed the owner and entitled to the use of" specified quantities of water. The concept of ownership of water by a state is wrong as water flowing in a natural stream is not subject to true proprietary ownership.

This question of ownership of the water of a non-navigable stream is of no importance in the case at bar. However, it is one of the fundamental issues in the case

of *Nebraska v. Wyoming*, et al., Original No. 7, 1942 Term, now pending and undisposed of on the docket of this Court. That case involves a dispute between Nebraska, Wyoming, Colorado and the United States over the waters of the North Platte River. The question of ownership is in dispute between the United States on one hand and the three states on the other hand. Each of the states, Colorado included, has asserted that the only rights which exist in water in its natural state are rights of use (*Tyler v. Wilkinson*, 4 Mason 397, 400, 241 Fed. Case No. 14312). It is a fundamental principle of the appropriation doctrine of water law that rights to water flowing in public streams may be acquired only by an actual diversion of water from the stream and an application thereof to a beneficial use, the rights so secured being entitled to recognition in the order of their priority. (*Arizona v. California*, 298 U. S. 558, 565, 56 S. Ct. 848).

In accordance with their theory that the only true ownership in flowing water is one of a right in use, the states contend in that case that the provisions of state constitutions and state statutes dedicating the waters of a stream to the public merely mean that the water is *publici juris*, subject to the plenary control of the states through which it flows.[28] It would seem that there should be no determination in this case on the matter of ownership which would have any persuasive effect upon the ultimate decision in the *Nebraska v. Wyoming* case. From the standpoint of uniformity in western water law the holdings in this regard should be the same in the two cases.

(b) A Decree Should Not Require The Measurement of Colorado Ditch Diversions.

Paragraph One of the Decree (Report p. 19) awards to Colorado 925,000 acre-feet annually. Paragraph Eight (Report p. 22) purports to enjoin Colorado, its officials and representatives "from diverting, taking and using

[28] See 1 *Kinney on Irrigation*, 2nd Ed., 656, 1 *Wiel on Water Rights*, 3rd Ed., 197, *California Oregon Power Company v. Beaver Portland Cement Company*, 295 U. S. 142, 163-164, 55 S. Ct. 725.

any water of the Arkansas river and its tributaries" in excess of the amount awarded to it. These provisions should be so clarified as to remove any basis for contentions that the Colorado diversions be measured at the ditch headgates.

Kansas can only be interested in the amount of water which flows across the state line. The uses to which the water is put in Colorado are of no concern to Kansas so long as the state line flows are properly maintained. If there is to be a decree of equitable apportionment, it should be confined to a determination of the amount of water which Colorado must deliver at the state line. No good purpose can possibly be served by requiring a measurement of the Colorado ditch diversions. That is an internal affair which concerns only Colorado.

The fixing of the share of a state in the amount of headgate diversions is an unsound method of equitable apportionment. Such diversions are in a large part made many miles above the state line. Surely the share of a state should be measured at the state line and not at thousands of points above that line. Moreover to determine the share of an upper state in terms of headgate diversions is to ignore entirely the factor of return flow. It is an undisputed fact that such return flow exists and the weight of the evidence is that the quantities are substantial (App. A, pp. 84-87). The Colorado evidence is that official measurement made during the years 1897 to 1904 disclosed that river gains due to return seepages or return flows amounted to an average of 106,000 acre-feet per year in the section between Pueblo and the state line (Tr. p. 883). These measured river gains represent the net effects of the return flow waters. Actual volumes of return flows reaching the river necessarily exceed the measured effects thereof in considering river gains by whatever channel losses prevail along the section. Such channel conveyance losses in this section of the river average 126,300 acre-feet annually (Tr. p. 3682). Similarly conducted measurements made during the years 1922 to 1925 disclose that river

gains due to return seepage had increased by 150,000 acre-feet annually and were then of a magnitude of 256,000 acre-feet per year (Tr. p. 884). Manifestly these return flows must be recognized and taken into consideration.

(c) The Findings of the Master Are Incomplete in Many Particulars.

In Colorado Exception XIV (p. 15), we have listed some ten respects in which the findings of the Master are either incomplete or inaccurate. No good purpose would be served by taking up each of these in detail. It is sufficient to say that a mere reading of the report of the Master shows its superficial character. Many millions of dollars have been invested in Colorado in an economic development which is dependent upon the flow of the Arkansas river. That civilization should be protected and maintained unless by reason thereof Colorado has in some respect violated the covenants which bind together the states of this Nation. This is not a case between private parties but one between states and it should be considered in the light of the dignity and standing of the states. We say respectfully but with insistence that the report of the Master, incomplete in many details and inaccurate in many others as we have shown herein, should not be used as the basis for a decree which will most vitally affect the civilization which has grown up in the Arkansas basin.

An equitable solution of this controversy cannot be reached without due regard for economic needs. It would seem entirely proper to point out that the natural reluctance to consider and adjudicate future possibilities is greatly strengthened by the impossibility of judging the requirements of the future by a present investigation of complicated issues of fact.

In this regard it is well to recognize the wisdom of a comment made in the article entitled "The Compact Clause of the Constitution—A Study in Interstate Adjustment", found in Volume 34, page 685 of the Yale Law Journal. We are quoting from page 707:

"The attempt to make an equitable apportionment of water among states within a given region has been sought through litigation as though it involved the riparian rights of neighboring individuals. The most informed professional opinion registers the failure of this attempt and the present movement towards solution by interstate treaties is a decisive recognition that the instrument of state-craft in this field is not court but compact. While assuming jurisdiction over these complicated and pervasive interstate difficulties the Supreme Court has recognized its own inadequacy to give relief. Continuous and creative administration is needed; not litigation, necessarily a sporadic process, securing at best merely episodic and mutilated settlements, which leave the central problems for adjustment unsolved."

In the New River Case (*U. S. v. Appalachian Electric Power Co.*, 311 U. S. 377, 423) this Court said:

"To predetermine, even in the limited field of water power, the rights of different sovereignties, pregnant with future controversies, is beyond the judicial function."

This statement is just as applicable to the field of irrigation as it is to the field of water power.

7.

THE DEFENDANTS' EXCEPTIONS TO THE REPORT AND RECOMMENDATIONS OF THE SPECIAL MASTER AMOUNT TO AN ATTEMPT TO REWRITE THE REPORT AND ARE WITHOUT SUPPORT IN THE EVIDENCE AND ARE UNFAIR TO COLORADO.

(a) The Defendants' Theory of Rewriting the Report and Decree with Changes Favorable to Their Interests Is Wrong in Theory and Unsupported By the Evidence and the Law.

Heretofore we have criticized in considerable detail

the Report and Recommendations of the Master. We believe that we have shown that the Report is not supported by the evidence or the law, is superficial, incomplete and inaccurate, and that the Recommended Decree is unworkable, impossible of enforcement and conducive to further litigation.

Such a report, we say, should not furnish the basis for a decree imposing a limitation on the quasi-sovereignty of the state of Colorado. It is so fatally defective that it is not subject to correction by the elimination of a few words here and the addition of a few words there. The Recommendations are basically unsound. They cannot be used as the groundwork upon which to build any workable, equitable apportionment.

(b) The Scheme of Apportionment Contained in the Kansas Exceptions is Inequitable.

The fundamental idea of the Kansas Exceptions is to obtain a decree which will award to Kansas 30.87% of the flow at the index stations at Canon City and the mouth of the Purgatoire as the same accrues day by day. (Exceptions, p. 13). We say this is inequitable because there is no showing that Kansas has received at any time in the past, was receiving at the time of the 1907 decision, or would use if it could receive a flow of any such amount or regularity. We have heretofore pointed out that historically, before the advent of irrigation, the Arkansas river at times went dry in the summer as far west as Rocky Ford, Colorado (Tr. pp. 3361-3374). The records do not disclose that the stream has ever been dry at Canon City. Hence, if Colorado is required under all conditions and at all times to pass a portion of the Canon City flow to Kansas, it will have to improve on nature. There is no showing that at the time of the 1907 decision, when this court expressly held that no relief should be granted against Colorado because it was not then using more than its equitable share of the waters of the stream, Kansas was receiving any such flow as amounted to 30.87% of the so-called index

flow. Since these index flows for the period 1908 to 1938 were of an annual average of 670,380 acre-feet, the application of this percentage figure would require delivery to Kansas of 206,946 acre-feet in the average year. This is in excess of the Master's finding of 185,000 acre-feet. There is no showing that Kansas has ever used this amount of water. Indeed, the evidence is as shown by Colorado Exhibit 213 (App. B, p. 65) that the calculated diversions by Kansas ditches for the period amounted on an average to 84,900 acre-feet annually. There is no showing of any Kansas enterprise under consideration which could utilize this amount of water. Indeed, the awarding to Kansas of this amount of water is to disregard recklessly all principles of beneficial use and protection of existing development.

(c) The Kansas Theory Ignores the Question of Conveyance Losses Between the Index Stations and State Line.

Kansas seeks to obtain 30.87% of the index flows as the water accrues day by day. This water under their contention must be delivered by Colorado at the Colorado-Kansas line. As we have repeatedly shown heretofore, the Arkansas is a losing river and there are substantial conveyance losses. Colorado evidence is that the annual conveyance loss between Pueblo and the state line is 126,000 acre feet. As we have shown above, using average figures, 30.87% of the index flows amount to a little over 206,000 acre-feet on an annual average. To get this amount of water to the state line there must be added 126,000 acre-feet on an annual average to take care of conveyance losses. Thus almost fifty percent of the index flows would in effect be given to Kansas and this in spite of the fact that in its former decision this Court held that Colorado had not exceeded its equitable apportionment even though its recognized ditch priorities were greatly in excess of the average stream flow. In other words, it is apparent from the Kansas contention that they do not accept the 1907 decision but are here trying to re-litigate the entire dispute between the states.

(d) Kansas Is Inconsistent in Claiming A Percentage of the Index Flows As They Accrue and in Also Claiming That the Water be Delivered when Required.

As pointed out above Kansas claims that it should be awarded 30.87% of the stream flows as they accrue at the index stations. This appears from their Exception Thirteen on page 18. By their Exception Nine on page 9 and Exception Twelve on page 16 it is clear they expect water to be delivered to them when required. It seems too obvious to require argument that water which accrues from day to day cannot be delivered when required. The intent of Kansas, however, is not obscure. They are insisting upon both requirements in the hope they may succeed in getting one.

(e) The Kansas Position with Relation To Flood Water Is Unfair.

In its Exception Thirteen (p. 18) Kansas seeks to have the Master's Conclusion of Law Five modified by the addition of the following language:

> "The amount of water passing such station (state line) in daily amounts larger than the accrued amounts as shown by said index stations shall be classed as flood water and shall not constitute a delivery under the allocation herein unless the same shall have been made pursuant to the request of Kansas state water officials."

Similar language is found in Exception Three, page 24. The purpose of this language is to have all accretions to the stream below and not measured by the index stations treated as flood waters. The treatment of the flows of these tributaries as flood waters is contrary to common sense. By the insertion of the quoted language Kansas merely hopes to get additional amounts of water. It must always be remembered that water flows down hill. Once it has crossed the state line, it is gone forever so far as Colorado is concerned. There is no equity in requiring more water to pass to Kansas than can and will

be used in that state. For flood water to be useful for irrigation it must be captured and stored for release in time of need. We have shown that the decreed reservoir capacity in Colorado is 653,427 acre-feet and in Kansas 25,800 acre-feet. Hence, there is more likelihood of flood waters being put to beneficial use in Colorado than in Kansas.

8.

IF A DECREE OF APPORTIONMENT IS TO BE MADE IT SHOULD FOLLOW THE 1933 STIPULATION.

Colorado most earnestly and sincerely asserts that Kansas has failed to show that there has been any material increase in the depletion of the waters of the river by Colorado to the injury of the substantial interests of Kansas, and hence the equitable apportionment made by this Court in its 1907 decision has not been destroyed. Without in any way waiving this position Colorado says further that if the Court for any reason considers that under the Cross-Bill some further definition or determination of the rights of Kansas is required, then a decree granting such relief should follow the principles and provisions of the 1933 Stipulation.

The Governors, the Attorneys General, the State Engineers and the Special Counsel of the two States and the counsel for the defendant, The Finney County Water Users' Association all signed this Stipulation in 1933. Six years later the attorneys for the defendants joined with the attorneys for the complainant in offering the Stipulation as a joint exhibit in this case (Tr. p. 6053). The Stipulation by its terms defines the amount of water necessary to maintain the *status quo* conditions in Colorado below the Caddoa Reservoir and in Kansas. Provision is made for proration at times of deficiency. The conservation storage in Caddoa Reservoir of surplus flows is recognized and it is provided that such conservation benefits shall be divided equally between the two States. The right of Colorado ditches upstream from Caddoa to benefit from Caddoa

storage through the operation of exchange agreements is sanctioned. These are the basic points. The administrative details necessary to carry the stipulation into effect were left to the administrative officials of the two States. Colorado has shown through the presentation of Plan F how the administration of the reservoir and the stream could have worked out for the period 1908 to 1938 had Caddoa Reservoir been in existence and operated under the stipulation. Testimony in connection therewith is that *status quo* conditions could have been maintained and each state could have received on an annual average over 35,000 acre-feet annually in conservation benefits.

Kansas has introduced no evidence directly attacking the stipulation. It has produced no testimony to show that the provisions thereof relative to the *status quo* are wrong or resulted from any mistake. Likewise the provision for the equal division of the benefits of conservation storage has not been disputed. Most surely the representatives of the defendants thought the stipulation was fair in 1933 or they would not have signed it and thought it fair in 1939 or they would not have joined in offering it in evidence. There is no claim of any change of conditions since either of those dates.

Colorado recognizes that the stipulation was neither ratified by the legislatures of the respective states, nor approved by Congress; hence it is not legally binding as an interstate compact. However, it is an agreement made and filed in a case pending in this Court and this Court has on at least three occasions recognized and acted upon stipulations made by the representatives of states in connection with interstate suits (See *Nebraska v. Iowa*, 145 U. S. 519, 12 S. Ct. 976; *Missouri v. Nebraska*, 197 U. S. 577, 25 S. Ct. 580; *Iowa v. Illinois*, 202 U. S. 59, 26 S. Ct. 571). If a decree were entered in accordance with the stipulation, Colorado could have no objection thereto. It entered into the stipulation in good faith and will comply with its terms.

CONCLUSION.

In the 17 arid and semi-arid western states wherein irrigation is practiced, the 1940 census showed over 20,500,000 acres of irrigated land, representing an investment in irrigation works, equipment and water rights of over one billion dollars. The average annual agricultural production from these lands amounts to several hundred million dollars in value. A very large proportion of these lands is dependent on the waters of interstate streams or their tributaries for irrigation. The Colorado, the Columbia, the Snake, the Rio Grande, the Yellowstone, the Missouri, the North Platte, the South Platte, the Arkansas and numerous other streams flow in more than one state and contribute water for irrigation of lands in more than one state. Interstate disputes over these waters are inevitable.[28]

The United States Constitution affords two means of settling such disputes, an original suit in the United States Supreme Court and an interstate compact approved by Congress. The compact method has many advantages and on at least three occasions has been recommended by this Court (*Washington v. Oregon*, 214 U.S. 205, 29 S. Ct. 631, 633; *Minnesota v. Wisconsin*, 252 U. S. 273, 283, 40 S. Ct. 313, 319; *New York v. New Jersey*, 256 U. S. 296, 313, 41 S. Ct. 492, 498).[29]

In a case such as this where the states have failed to compact, the question of the relief which the Court can decree is of primary importance. Since a court is a judicial and not an administrative body, the relief possible is limited to a determination of legal rights and is further limited by the reluctance of the Court to impose any restrictions on the quasi-sovereignty of a state. Hence, any decision is confined to a determination of whether a complaining state

[28]For examples of western river controversies settled by compact see La Plata River Compact, 43 Stat. 796; Colorado River Compact, House Document 605, 67th Congress, Fourth Session; Colo. Session Laws 1923, Chap. 189; South Platte River Compact, 44 Stat. 195; Rio Grande Compact, 53 Stat. 785; Red River Compact, 52 Stat. 150; Republican River Compact, 78th Congress, Ch. 104, Public Law 60, approved May 26, 1943. For a compilation of interstate water compacts see National Resources Planning Board Technical Paper No. 5 "Interstate Water Compacts 1785-1941."

has shown an injury of serious magnitude and what relief may be granted to remedy that specific injury.

Colorado is a state of high mountains which give birth to countless streams that eventually furnish water for the irrigation of lands in at least ten states. Colorado recognizes a solemn obligation to respect the equitable rights of those other states, but at the same time it would be derelict in its duty to its citizens if it did not endeavor to the utmost to protect the civilizations which they have built upon the foundation of irrigation.

Because of its geographical position, Colorado is keenly aware of the difficulties attendant upon a solution of these interstate water controversies. The definition of legal rights is both necessary and important, but to the irrigator a fair and flexible plan of administration is of equal importance. Fundamentally, the water problems of the West are problems of administration. An important natural resource must be so conserved and utilized that the greatest possible benefit is obtained.

Respectfully submitted,

GAIL L. IRELAND,
Attorney General of the State of Colorado,

SAMUEL L. FAIRLAMB,
Assistant Attorney General,

ARTHUR C. GORDON,
Special Assistant Attorney General.

A. W. MCHENDRIE,
HENRY C. VIDAL,
JEAN S. BREITENSTEIN,
CLIFFORD H. STONE,

Special Counsel for Complainant,

Denver, Colorado,
September 1, 1943.